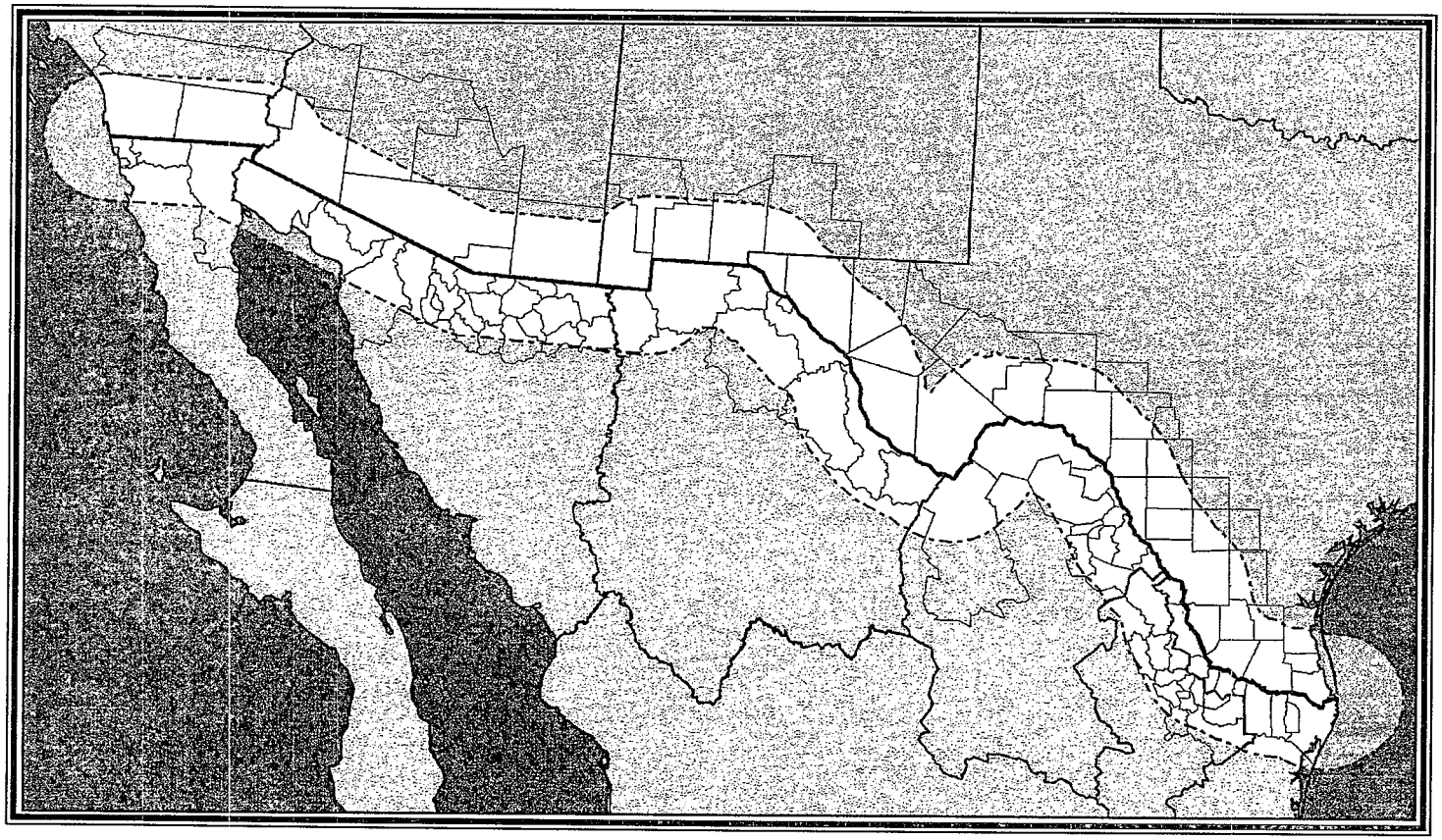
US - MEXICO
Border XXI Program
Framework Document

October 1996

EPA 160-R-96-003



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MISSION STATEMENT

The mission of Border XXI is to achieve a clean environment, protect public health and natural resources, and encourage sustainable development along the U.S.-Mexico border.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 7 1996

THE ADMINISTRATOR

The President
The White House
Washington, DC 20500

Dear Mr. President:

Secretary Babbitt, Secretary Shalala, and I are pleased to present you with a comprehensive plan for protecting public health and the environment along the U.S.-Mexico border. The U.S.-Mexico Border XXI Program is an unprecedented binational effort to address the environmental and public health challenges facing the border communities of our two nations. Border XXI will help to ensure a commitment to sustainable development along the border -- so that economic growth and environmental protection will go hand in hand.

Residents on both sides of the border participated extensively in the development of Border XXI. The program is flexible enough to allow different approaches for different communities. Community concerns, changing conditions, and economic and budget realities will be taken into account when setting priorities under the program.

This plan represents an important milestone in the long history of cooperation among numerous environmental, health and natural resources agencies in the U.S. and Mexico. Border XXI will further this cooperation by strengthening the partnerships among our federal agencies as well as among local, tribal, and state governments, and business, academic and non-governmental organizations.

We are committed to meeting the challenge of translating the plan's long-term goals into tangible environmental improvements. Both governments have agreed to develop performance measures that can track progress and inform future program and budget decisions.

We are committed to the success of Border XXI and the protection of our most valuable resources -- our people and our environment.

Sincerely,

Carol M. Browner

SECRETARY OF ENVIRONMENT
NATURAL RESOURCES AND FISHERY

Mexico, D. F. October 15, 1996

TO: DR. ERNESTO ZEDILLO PONCE DE LEON

FROM: M. EN C. JULIA CARABIAS LILLO

SUBJECT: INTRODUCTION OF THE BORDER XXI PROGRAM

It is a pleasure to inform you that the Border XXI Program has been concluded and is responsive to the commitment made by your Government to generate environmental alternatives for the border communities of our country.

The Program establishes objectives, projects, and actions for the protection of the environment, natural resources, and the health of residents of the northern border area of our country. This document has been negotiated with the United States Government and continues previous efforts in the interinstitutional collaboration, both domestically and binationally. The participation of state governments, municipalities, and local governments, as well as that of academia, the private sector, and non-governmental organizations, have been equally important in this effort.

Through an intense process of public participation, the residents of both sides of the border have enriched the document by sharing their concerns and proposing solutions for their communities.

Together with Secretaries Rojas and De la Fuente, we believe we have achieved an integrated Program that addresses the complex environmental problems affecting the border communities. The document attempts to promote a transition toward sustainable development in the border area by seeking a balance among social and economic factors, the protection of the environment and natural resources.

Likewise, our commitment is to face the challenge of translating the medium-range goals of the Program into visible and tangible results. To this end, both governments have agreed to take actions to develop environmental performance indicators that will allow qualitative and quantitative tracking of the progress achieved by the Program and guide future budgetary decisions.

We consider that the present Program will contribute significantly to the long history of bilateral environmental cooperation in the border area, through the different levels of Government and through new channels of collaboration facing the twenty-first century. With this, we want to reinforce our commitment to the environment, natural resources, and the well-being of the population of the region.

In order to publicly inform the border community of the Border XXI Program, we will make a public presentation in the City of Tijuana, B.C., next November 21.

(Signed: Ma. Julia Carabias)

SECRETARIA DE MEDIO AMBIENTE, RECURSOS NATURALES Y PESCA

Mexico, D. F. a 15 de octubre de 1996

PARA: **DR. ERNESTO ZEDILLO PONCE DE LEON**

DE: **M. EN C. JULIA CARABIAS LILLO**

ASUNTO: **PRESENTACION DEL PROGRAMA FRONTERA XXI.**

Me es grato dirigirme a usted para informarle que el Programa Frontera XXI ha sido concluido y responde al compromiso asumido por su gobierno de generar alternativas ambientales para las comunidades fronterizas de nuestro país.

Dicho Programa establece objectivos, projectos y acciones para el cuidado del medio ambiente, los recursos naturales y la salud de los residentes de la frontera norte de nuestro país. Este documneto has sido negociado con el gobierno de los Estados Unidos y continua esfuerzos anteriores en la colaboración interinstitucional, tanto al interior de cada uno de los países, como a nivel binacional. Igualmente importante has sido en su conformación la actuación de los gobiernos estatales, municipales y locales, así como la de los sectores académico, empresarial y las organizaciones no gubernamentales.

A través de un intenso proceso de consulta pública, los habitantes de ambos lados de la frontera han enriquecido el documento al transmitirnos sus preocupaciones y proponer soluciones para sus comunidades.

Creemos haber logrado, junto con los secretarios Rojas y De la Fuente, un Programa integrador para abordar la compleja problemática que en materia ambiental, padecen las comunidades fronterizas. El documento pretende promover la transición al desarrollo sustentable en la franja al buscar un equilibrio entre los factores sociales y económicos, la protección al ambiente y los recursos naturales.

Asimismo, es nuestro compromiso enfrentar el reto que significa traducir las metas de mediano plazo del Programa, en resultados visibles y tangibles. Para ello, ambos gobiernos hemos acordado acciones para desarrollar indicadores de desempeño ambiental, que permitan dar un sequimiento cualitativo y cuantitativo de los avances que se vayan logrando dentro del Programa, y sirvan como quía para decisiones presupuestales futuras.

Consideramos que el presente Programa puede contribuir significativamente a la larga trayectoria de cooperación bilateral ambiental en la frontera, a través de los distintos niveles de gobierno, y de nuevos canales de colaboración de cara al siglo XXI. Con esto, queremos afianzar nuestro compromiso con el medio ambiente, los recursos naturales y el bienestar de la problación de la región.

A fin de dar a conocer públicamente al Programa Frontera XXI a la comunidad de la franja, haremos una presentación pública en la Ciudad de Tijuana, B.C., el próximo 21 de noviembre.

M. Julia Carabias

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Glossary of Abbreviations

ACAAN	Acuerdo de Cooperación Ambiental del Norte (see NAAEC)
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AID	U.S. Agency for International Development
APHIS	Agriculture Pest Health Inspection Service
ASU	Arizona State University
ATSDR	Agency for Toxic Substance and Disease Registry
BANDAN	Banco para el Desarollo de América del Norte (see NADBank)
BBS	Bulletin Board System
BECC	Border Environment Cooperation Commission (see COCEF)
BHO	Border Health Office
BLM	Bureau of Land Management
BMP	Best Management Practices
BOR	Bureau of Reclamation
BRD	Biological Resources Division of USGS
Cal-DTSC	California Department of Toxic Substances Control
CAMEO	Computer aided Management of Emergency Operations
CARB	California Air Resources Board
CCA	Comisión de Cooperación Ambiental de América del Norte (see CEC)
CCPC	Comité Consultivo Público Conjunto de la CCA (see JPAC)
CDC	Centers for Disease Control
CDFG	California Department of Fish and Game
CDHS	California Department of Health Services
CEAS	Comisión Estatal de Aguas y Saneamiento de Coahuila (Coahuila State Commission for Water and Sanitation)
CEC	Commission for Environmental Cooperation (see CCA)
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CES	Centro Ecológico de Sonora (Sonora Ecological Center)
CESPM	Comité Estatal de Servicios Públicos de Mexicali (State Committee for Public Services of Mexicali)
CFC	Chlorofluorocarbons
CFP	Cooperative Fisheries Program
CICA	U.S.-Mexico Information Center on Air Pollution
CICOPLAFEST	Comisión InterSecretarial para el Control de Plaguicidas, Fertilizantes y Subtancias Tóxicas (Interagency Commission for Control of Pesticides, Fertilizers and Toxic Substances)
CICTUS	Centro de Investigaciones Científicas y Tecnológicas (Center for Scientific and Technological Research)
CIDESON	Centro de Investigación y Desarollo de Sonora (Sonora Center for Research and Development)
CIESIN	Consortium for International Earth Sciences Information Network
CILA	Comisión Internacional de Límites y Aguas (see IBWC)
CITES	Convention on International Trade for Endangered Species
CLAM	Comité Local para Ayuda Mutua (Local Committee for Mutual Assistance)

CNA	Comisión Nacional de Agua (National Water Commission)
CO	Carbon monoxide
COAPES	Comisión de Agua Potable y Alcantarillado del Estado de Sonora (Sonora State Commision for Drinking Water and Sewers)
COCEF	Comisión de Cooperación Ecológico Fronterizo (see BECC)
COLEF	El Colegio de la Frontera Norte (College of the Northern Border)
CONABIO	Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (National Commission for Knowledge and Use of Biodiversity)
CONACYT	Consejo Nacional de Ciencia y Tecnología (National Advisory Council for Science and Technology)
COSAE	Comisión de Servicios de Agua del Estado de Baja California (Water Utilities Commission for the State of Baja California)
CWS	Canadian Wildlife Service
DEM	Digital elevation model
DFG	Department of Fish and Game (California)
DGPS	Differential Geographic Positioning System
DIAAPROY	Diseño, Asesoría, y Administración de Proyectos, S.A. de C.V. (Project Design, Assistance, and Management, Inc.)
DLG	Digital line graph
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
DOJ	U.S. Department of Justice
DOQ	Digital ortho-quadrangles
DOS	U.S. Department of State
DOT	U.S. Department of Transportation
DRGs	Digital raster graphics
DUMAC	Ducks Unlimited de Mexico, A.C.
EDF	Environmental Defense Fund
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
EPA/OW	U.S. Environmental Protection Agency - Office of Water
EPA R6	U.S. Environmental Protection Agency - Region 6
EPA R9	U.S. Environmental Protection Agency - Region 9
EPCCHED	El Paso City and County Health and Environment Department
EPOMEX	Programa de Ecología, Pesca, y Oceanografía del Golfo de México (Gulf of Mexico Program for Ecology, Fisheries, and Oceanography)
FCC	U.S. Field Coordinating Committee (DOI)
FDA	Food and Drug Administration
FONSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
FY	Fiscal Year
GCD	Grupo Coordinador Estatal del Proyecto de Descentralización (State Coordinating Group for the Decentralization Project)
GGA	Grupo de Gestión Ambiental Estatal (State Environmental Management Group)
GIS	Geographical Information Systems

GNEB	Good Neighbor Environmental Board
GPS	Global Positioning System
HAZTRAKS	Hazardous Waste Tracking System
HHS	U.S. Department of Health and Human Services
HMMD	County of San Diego - Hazardous Materials Management Division
HRSA	Health Resources and Services Administration
HUD	U.S. Department of Housing and Urban Development
IB	Instituto de Biología, UNAM (Biology Institute, UNAM)
IBEP	Integrated Border Environmental Plan, *Integrated Environmental Plan for the U.S.-Mexico Border Area, First Stage (1992-94)* (see PIAF)
IBWC	International Boundary and Water Commission (see CILA)
ICC	Interagency Coordinating Committee
ICMA	International City/County Management Association
IID	Imperial Irrigation District
IMADES	Instituto del Medio Ambiente y el Desarollo Sustentable del Estado de Sonora (State of Sonora Institute for the Environment and Sustainable Development) - formed through the joining of CIDESON and CES
IMSS	Instituto Mexicano del Seguro Social (Mexican Institute for Social Security)
INAH	Instituto Nacional de Antropología e Historia (National Institute for Anthropology and History
Inc.	Incorporated (see S.A. de C.V.)
INE	Instituto Nacional de Ecología (National Institute for Ecology)
INEGI	Instituto Nacional de Estadística, Geografía, e Informática (National Institute for Statistics, Geography, and Information)
INIFAP	Instituto Nacional de Investigaciones Forestales, Agrícola y Pecuaria (National Institute for Investigations of Forests, Agriculture and Livestock)
INP	Instituto Nacional de Pesca (National Institute of Fisheries)
ISO 14000	International Standards Organization 14000 (14000 is a series of standards on environmental management)
ISSSTE	Instituto de Seguridad Social y Servicios para los Trabajadres del Estado (Institute for Social Security & Services for State Workers)
ITESM	Instituto Tecnológico de Estudios Superiores de Monterrey (Technology Institute of Superior Studies of Monterrey)
IWMB	Integrated Waste Management Board
IWRC	Iowa Waste Reduction Center
IWTP	International Wastewater Treatment Plant
JCP	Joint Contingency Plan
JMAS	Junta Municipial de Alcantarillado y Saneamiento de Ciudad Juárez (Sewer and Sanitation Municipal Authority for Ciudad Juarez)
JPAC	Joint Public Advisory Committee for the CEC (see CCPC)
JRT	Joint Response Team
LEPC	Local Emergency Planning Committee
LIDAR	Light, intensity, distancing, and ranging
LOI	Letter of intent
lps	Liters per second
MEXUS	MOU on fisheries investigation between Mexico and the U.S. for the Gulf of Mexico and the Pacific Ocean

MMS	U.S. Minerals Management Service
MOU	Memorandum of Understanding
NAAEC	North American Agreement on Evironmental Cooperation (see ACAAN)
NAAQS	National Ambient Air Quality Standards
NADBank	North American Development Bank (see BANDAN)
NAFTA	North American Free Trade Agreement (see TLC)
NAS	National Audubon Society
NASQAN	National Stream Quality Accounting Network
NAWCC	North American Waterfowl Conservation Commission
NAWQAP	National Water Quality Assessment Program
NBEP	Northern Border Evironmental Program (see PAFN)
NBII	National Biological Information Infrastructure
NGO	Nongovernmental organization
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institute of Health
NIWTP	Nogales International Wastewater Treatment Plant
NJDEP	New Jersey Department of Environmental Protection
NMBHO	New Mexico Border Health Office
NMDFG	New Mexico Department of Fish and Game
NMDOH	New Mexico Department of Health
NMED	New Mexico Environment Department
NMFS	National Marine Fisheries Service
NM-GIC	New Mexico Geographic Information Council
NMSU	New Mexico State University
NOAA	U.S. National Oceanic and Atmospheric Administration
NOS	U.S. National Ocean Service
NOx	Oxides of Nitrogen
NPS	National Park Service
NRCS	U.S. Department of Agriculture - Natural Resources Conservation Service
NTDs	Neural tube defects
NWR	National Wildlife Refuge
O_3	Ozone
OCRM	Ocean and Coastal Resource Management
ONG	Organizaciones no Gubernamentales (see NGO)
OPS	Organización Panamericana para la Salud (see PAHO)
OWM	Office of Wastewater Management
P2	Pollution Prevention/Prevención de la Contaminación
PAFN	Programa Ambiental de la Frontera Norte (see NBEP)
PAH	Polycyclic aromatic hydrocarbons
PAHO	Pan American Health Organization (see OPS)
Pb	Lead
PCS	Permit and Compliance System
PEMEX	Petroleos Mexicanos (Mexican Petroleum Company)
PHS	Public Health Service
PM-10	Particulate matter (size = less than 10 microns)
PND	Plan Nacional de Desarollo (Mexico's National Development Plan)
PROFAUNA	Asociación para la Protección de la Fauna, A.C. (Association for the Protection of Wildlife)

PROFEPA	Procuraduría Federal de Protección al Ambiente (Federal Attorney General for Environmental Protection)
PRTR	Pollution Release and Transfer Registry
PSU	Pennsylvania State University
QA/QC	Quality Assurance/Quality Control
RMRS	Rocky Mountain Research Station
RTP	Research Triangle Park
RWQCB	Regional Water Quality Control Board
S.A. de C.V.	Sociedad Anónima de Capital Variable (see Inc.)
SAGAR	Secretaría de Agricultura, Ganadería, y Desarollo Rural (Mexican Secretariat for Agriculture, Cattle, and Rural Development)
SAHOPE	Secretaría de Asentamientos Humanos y Obras Públicas del Estado (Baja California State Secretariat for Human Housing and Public Works)
SARH	Secretaría de Agricultura y Recursos Hidráulicos (Mexican Secretariat for Agriculture and Hydraulic Resources)
SCT	Secretaría de Comunicaciones y Transportes (Mexican Secretariat of Communication and Transportation)
SCERP	Southwest Center for Environmental Research and Policy
SE	Secretariat of Energy
SDSU	San Diego State University
SEAGO	Southeastern Arizona Governments Organization
SEDESOL	Secretaría de Desarollo Social (Mexico's Secretary for Social Development)
SEDUE	Secretaría de Desarollo Urbano y Ecología (Mexican Secretary for Urban Development and Ecology)
SEMARNAP	Secretaría de Medio Ambiente Recursos Naturales y Pesca (Mexico's Secretary for the Environment, Natural Resources, and Fisheries)
SFFS	Subsecretaría Forestal y de la Fauna Silvestre (Subsecretariat for Forestry and Wildlife)
SIP	State Implementation Plan
SIUE	Secretaría de Infraestrucura Urbana y Ecología, Sonora (Secretary for Urban Infrastructure and Ecology, Sonora)
SO_2	Sulfur dioxide
SRE	Secretaría de Relaciones Exteriores - (Mexico's Secretariat for External Affairs)
SRN	Subsecretaría de Recursos Naturales, (Undersecretariat for Natural Resources, under SEMARNAP)
SSA	Secretaría de Salud (Mexico's Secretary of Health)
SWRCB	State Water Resources Control Board (California)
TB	Tuberculosis
TDH	Texas Department of Health
TDPS	Texas Department of Public Safety
Texas (STEP)	Texas Small Towns Environment Program
TGLO	Texas General Land Office
TIGER	Topologically Integrated Geographic Encoding and Referencing
TLC	Tratado de Libre Comercio (see NAFTA)
TNRCC	Texas Natural Resource Conservation Commission
TNRIS	Texas Natural Resource Information System
TPWD	Texas Parks and Wildlife Department
TRI	Toxics Release Inventory

TRIP	Transboundary Resource Inventory Project
TSP	Total suspended particulates
TWDB	Texas Water Development Board
TX-GISPC	Texas Geographic Information Systems Planning Council
UAAAN	Universidad Autónoma Agraria Antonio Narro (Antonio Narro Autonomous Agrarian University)
UABC	Universidad Autónoma de Baja California (Autonomous University of Baja California)
UACH	Universidad Autónoma de Chihuahua (Autonomous University of Chihuahua)
UAG	Universidad Autónoma de Guadalajara (Autonomous University of Guadalajara)
UAM	Universidad Autónoma Metropolitania (Autonomous Metropolitan University)
UANL	Universidad Autónoma de Nuevo León (Autonomous University of Nuevo Leon)
UAS	Universidad Autónoma de Sonora
UAT	Universidad Autónoma de Tamaulipas
UCANP	Unidad Coordinadora de Areas Naturales Protegidas, INE (Division of Coordination of Natural Protected Areas)
UCAI	Unidad de Coordinación de Asuntos Internacionales, SEMARNAP (Office of Coordination of International Activities)
UCD	University of California at Davis
UNAM	Universidad Nacional Autónoma de Mexico (Autonomous National University of Mexico)
UNISON	Universidad de Sonora (University of Sonora)
UNM	University of New Mexico
UNT	University of North Texas
U of A	University of Arizona
USACE	U.S. Army Corps of Engineers
USD	United States Dollars
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USMBHA	U.S.-Mexico Border Health Association
UT	University of Texas
UTA	University of Texas at Austin
UT-BEG	University of Texas at Austin, Bureau of Economic Geology
UTEP	University of Texas at El Paso
U of U	University of Utah
VOCs	Volatile organic compounds
WEF	Water Environment Federation
WGA	Western Governors Association

CHAPTER I

INTRODUCTION

Overview

The Border XXI Program (Border XXI or Program) is an innovative binational effort which brings together the diverse U.S. and Mexican federal entities responsible for the shared border environment to work cooperatively toward sustainable development through protection of human health and the environment and proper management of natural resources in both countries.

Attempts to address border environmental concerns require a coordinated binational response. The ecosystems, watersheds, and air basins that make up the environment[1] and natural resource base of the border region transcend political boundaries. Regardless of where they originate, border environmental problems significantly impact communities and ecosystems on both sides of the border. Border XXI Program activities will respect the sovereign rights of the U.S. and Mexico to manage their own resources according to their own policies, ensuring that such activities do not cause damage to the environment of the neighboring country.

The central strategy of Border XXI consists of three components: public involvement, decentralization of environmental management through state and local capacity building, and improved communication and cooperation among federal, state and local government agencies. The federal governments of both nations acknowledge the importance of cooperative efforts. To this end, they are committed to working with their state and local counterparts and with residents of the border region to further define and realize the vision of sustainable development underlying Border XXI.

This *Border XXI Framework Document* (Framework Document), a product of significant public input, defines five-year objectives for the border environment and describes mechanisms for fulfilling those objectives. Considerable efforts have been made to incorporate public comments into this Framework Document. A separate report, entitled *The Border XXI Comment and Response Report,* will address in more detail all major issues raised during the public comment period. A significant element of Border XXI will be the development of an agreed upon set of environmental indicators or measures of success that track progress toward achieving the Program's long-term objectives.[2]

Goal: Sustainable Development

The principal goal of the Border XXI Program is to promote sustainable development in the border region by seeking a balance among social and economic factors and the protection of the environment in border communities and natural areas.

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[1]Throughout this document, the terms "environment" and "environmental" are broadly defined so as to encompass issues related to the environment, environmental health, and natural resources of the border region.

[2]This activity supports the goals of the 1993 Government Performance and Results Act in the United States and similar efforts in Mexico.

Agenda 21, a series of international environmental objectives, which emerged from the United Nations Conference on Environmental Development (UNCED), held in 1992 in Rio de Janeiro, Brazil, provides guiding principles for sustainable development on a global basis. Agenda 21 encourages citizens and governments at various levels to define specific programs that support sustainable development, as it applies to their own community.

In accordance with these concepts, Border XXI promotes sustainable development in the border region which "meets the needs of the present without compromising the ability of future generations to meet their own needs."[3]

Sustainable development is, in principle, a global concept of development which considers at least four interrelated features: environmental, social, economic, and technological. Given the nature of the governmental agencies participating in the Border XXI Program, the Program emphasizes the environmental aspects (including natural resources) of sustainable development, as well as social features as they pertain to environmental health. It also provides a point of departure for economic and technological considerations by promoting pollution prevention and the use of clean technologies.

Social considerations are central to sustainable development. To advance the goal of sustainability, the Border XXI Program must be aligned with efforts undertaken by both governments to further social progress for border residents.

In Mexico, various sectoral programs derived from the National Development Plan seek to improve the living conditions of the population throughout the country. The Border XXI Program will be coordinated with programs that are oriented toward social development including the Programs for Poverty Eradication, Agricultural Development and Rural Development, Industrial Policy and Economic Deregulation, and New Federalism, among others.

In the United States, the number of people, per capita, living in poverty is significantly higher in the border area than in other parts of the country. Under direction from Presidential Executive Order 12898, which was issued on February 11, 1994, U.S. federal agencies are incorporating environmental justice into their mission. Environmental justice efforts attempt to address the disproportionately high and adverse human health or environmental impacts experienced by minority and low income populations in the U.S.

Any attempt to promote sustainable development must evaluate and address environmental concerns at the local level. The governments of the U.S. and Mexico hope to enlist the aid of border communities, including nongovernmental organizations, academia and the private sector, to help define and apply the principles of sustainable development as they pertain specifically to each local community.

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[3]The World Commission on Environment and Development (The Brundtland Commission), *Our Common Future* (Oxford: Oxford University Press), 1987, p. 43.

Historical Background

For many years, the U.S. and Mexico have been involved in formal and informal cooperative efforts associated with protecting the environment and natural resources of our common border. Numerous bilateral agreements guide both countries' efforts in the border area. These agreements are described in greater detail in Appendix 1.

Despite these bilateral efforts, unsustainable practices in the border region have resulted in degradation of environmental conditions. Industrialization has brought important economic benefits to the border region; however, it has also been accompanied by accelerated population growth and unsustainable production and consumption which surpass the capacity of the natural resource base as well as that of basic infrastructure (particularly with regard to water resources). These conditions present a threat to biodiversity and air and water quality, and pose health risks to border residents.

Since its creation in 1889, particularly since its consolidation as a binational organization with the Treaty on Utilization of Waters in February 1944, the International Boundary and Water Commission has fulfilled an important role in coordination, assessment, supervision, administration, and operation and maintenance of binational sanitation infrastructure and public works along the border, efforts that have contributed to the resolution of problems faced by the border population.

In order to protect, improve, and conserve the environment of the border region, in 1983 both governments signed the Agreement for the Protection and Improvement of the Environment in the Border Area (La Paz Agreement) which provided a formal foundation for cooperative environmental efforts. The La Paz Agreement defined the border region as the area lying 100 kilometers or 62.5 miles to the north and south of the U.S.-Mexico boundary. Work carried out under the La Paz Agreement is coordinated by two National Coordinators: the International Affairs Coordinator in SEMARNAP and the Assistant Administrator for International Activities of EPA.

In February 1992, the environmental authorities of both governments released the Integrated Environmental Plan for the Mexican-U.S. Border Area (IBEP). While the IBEP represented a reasonable point of departure for addressing environmental concerns in the border region and resulted in significant investments in infrastructure, critics held that it was limited in scope, implemented without sufficient public input, and failed to adequately address natural resource and environmental health concerns. The Border XXI Program builds on the efforts of the IBEP. As the next phase of binational planning, Border XXI is designed to overcome the identified shortcomings of the IBEP. To this end, the scope of Border XXI has been expanded to include health and natural resource issues. In addition, this Framework Document reflects extensive public input, and the Program is organized to facilitate federal, state and local involvement.

Funding for implementing Border XXI is based on annual appropriations by the U.S. Congress and by Mexico's Ministry of Finance. To fulfill Border XXI objectives in the Mexican border region, the Government of Mexico will draw on two additional sources of funding: the Northern Border Environmental Program (1994-2000) and the Second Project for Solid Wastes (1995-2000). Both are loan agreements between the World Bank and the Government of Mexico and were signed in 1994 and 1995, respectively.

Participants

The success of Border XXI is contingent upon broad-based, binational participation by federal, state and local governments, Indian tribes, international institutions, academia, nongovernmental organizations, the private sector, and border citizens and communities.

The key federal agencies involved in developing and implementing Border XXI are:

1) Environmental Protection: the U.S. Environmental Protection Agency (EPA) and Mexico's Secretariat for Environment, Natural Resources and Fisheries (SEMARNAP) and Secretariat for Social Development (SEDESOL).

2) Natural Resources: the U.S. Department of the Interior (DOI), the U.S. Department of Agriculture (USDA), and SEMARNAP.

3) Border Water Resources: U.S. and Mexican Sections of the International Boundary and Water Commission (IBWC), DOI, EPA, and SEMARNAP.

4) Environmental Health: the U.S. Department of Health and Human Services (HHS) and Mexico's Secretariat of Health (SSA).

Other important federal participants involved in the Border XXI Program include the U.S. Department of State (DOS), the U.S. National Oceanic and Atmospheric Administration (NOAA), the U.S. Agency for International Development (AID), the U.S. Department of Justice (DOJ), the U.S. Department of Transportation (DOT), the U.S. Department of Energy (DOE), and Mexico's Secretariat of Foreign Relations (SRE), National Institute for Statistics, Geography, and Information (INEGI), Secretariat of Interior (Civil Protection), Secretariat of Communication and Transportation (SCT), and Secretariat of Energy (SE).

In a parallel agreement to the North American Free Trade Agreement (NAFTA), the United States and Mexico established the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) to improve environmental infrastructure in the border area. The BECC and the NADBank will be integral partners in fulfilling the goals of Border XXI.

To further their commitments to environmental protection, the NAFTA partners (Mexico, the United States and Canada) signed an environmental side agreement to NAFTA on September 3, 1993. This agreement established the Commission for Environmental Cooperation (CEC) headquartered in Montreal, Canada. Some of the Border XXI projects complement aspects of the CEC cooperative work program. This interface provides an opportunity for improving U.S.-Mexico border environmental and natural resource management as part of a North American solution.

State and local governments and indigenous communities have a broad understanding of the particular problems and solutions impacting their communities. In the U.S., the four border states, as well as counties, municipalities, and Indian tribes located in the region, will be involved in the Program. In Mexico, the six border states and principal border municipalities will be actively engaged in Border XXI.

In order to facilitate public input into Border XXI, the federal governments are enlisting the assistance of their respective public advisory boards, the Good Neighbor Environmental Board (GNEB) for the U.S., and the Advisory Council for Sustainable Development (Region 1) in Mexico.[4]

Nine binational Border XXI Workgroups will implement the Program by integrating the efforts of participating entities and defining specific projects to meet Border XXI objectives. Each Workgroup operates under the guidance of a U.S. and Mexican Cochairperson (Cochair). Many of the Workgroups have a long-standing history of binational cooperation. The Workgroups will ensure effective coordination of bilateral efforts by bringing together federal agencies from both countries with interests in a given issue. All of the Workgroups are committed to actively encouraging state participation in their endeavors. The Workgroups will explore the development of subgroups or other mechanisms to facilitate the participation of border communities in their implementation of the Program.

The six Workgroups that were initiated under the La Paz Agreement are (1) water, (2) air, (3) hazardous and solid waste, (4) pollution prevention, (5) contingency planning and emergency response, and (6) cooperative enforcement and compliance. Recognizing that the environment needs to be considered from a comprehensive perspective, Border XXI integrates three new Workgroups. These are (7) environmental information resources, (8) natural resources, and (9) environmental health.[5]

These nine Workgroups will meet individually as necessary and will convene as a whole at least once a year. New workgroups may be added in the future should the need arise on a specific environmental concern.

The National Coordinators (EPA and SEMARNAP) will guide the Border XXI Workgroups in their efforts to implement the Program. The National Coordinators will rely on and coordinate with policy makers from DOI, HHS and SSA. Contact information for the National Coordinators, Workgroup Cochairs and Workgroup staff is included in Appendix 2. Additional information on participating agencies appears in Appendix 3 of this document.

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[4]In the U.S., the GNEB is congressionally mandated to advise the President and Congress on matters concerning environmental and infrastructure needs within the U.S. states contiguous to Mexico. In Mexico, the Regional Advisory Council for Sustainable Development is a national advisory council with four regional subgroups created by SEMARNAP in 1995 to provide for public consultations with SEMARNAP. Region 1 covers the northern border of Mexico.

[5]Each group will build on past and ongoing efforts and will determine its own organizational structure and mechanisms for funding and implementing specific projects. The Water, Air, Hazardous and Solid Waste, Contingency Planning and Emergency Response, Cooperative Enforcement and Compliance, and Pollution Prevention Workgroups will continue and expand on the work of the EPA-SEMARNAP La Paz Workgroups which have been in existence for a number of years. The Natural Resources Workgroup will build on existing binational agreements and cooperative projects between the two countries. The Environmental Information Resources Workgroup will build on recent binational attempts to improve environmental data collection and management efforts in the border region. The Environmental Health Workgroup will build on the efforts of the U.S. Interagency Coordinating Committee (ICC) and its ongoing and expanding work with Mexico's Secretary of Health (SSA).

Implementation

The central challenge facing Border XXI participants is translating long-term Border XXI objectives into tangible environmental improvements. As part of their overall strategic planning efforts for the border region, both governments recognize the importance of program evaluation and are committed to developing performance measures for the Border XXI Program.

In the next few years, U.S. federal agencies will be incorporating performance-based management into the development and implementation of federal programs. A similar process, which incorporates environmental performance measures into long-term strategic planning, is being initiated in Mexico. Accordingly, the Border XXI Program will attempt to link budget processes and programmatic management to specific results through environmental performance measures. The two governments will provide the public information on specific Border XXI performance measures as they are developed.

To this end, the National Coordinators will lead a Strategic Planning and Evaluation Team to review the long-term Border XXI objectives, develop indices to measure progress toward meeting these objectives, and report on performance to both those respective U.S. and Mexican entities responsible for annual budget allocations, and the general public. Considering that funding for Border XXI is received on an annual basis, it is essential that progress be clearly measured and reported to ensure the continued support of the general public and federal budget decision-makers in both countries.

Each year the nine Workgroups will develop *Border XXI Annual Implementation Plans*. These *Annual Implementation Plans* will identify federal funding levels for a given year and, based upon available funds, describe specific projects that will advance the long-term objectives contained in this Framework Document. The development of these *Annual Implementation Plans* will ensure correlation of short-term budget realities with the long-term planning required to fulfill the Border XXI objectives. Accordingly, it must be emphasized that project implementation is contingent upon the availability of resources.[6]

Currently, the *Annual Implementation Plans* provide basic information on specific projects to be initiated by the Workgroups in 1996. In the future, the Workgroups will develop their *Annual Implementation Plans* at the beginning of each calendar year. From 1997 forward, the *Annual Implementation Plans* will include the following components: federal funding levels for the year, specific projects for the year based on those funding levels, and an assessment of progress in implementing specific projects.

All of the objectives in the Framework Document have been identified as priority concerns by both governments and border communities. In order to track the extent to which actual projects identified in the *Annual Implementation Plans* build toward Border XXI objectives, the two governments have agreed to issue *Biennial Progress Reports* on the Border XXI Program.

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[6]Appendix 4 includes information on annual budgets, the process for developing binational estimates for Border XXI resource needs, and a description of additional funding sources.

While the Workgroups will assess progress on their particular projects in their *Annual Implementation Plans*, the *Biennial Progress Report* will provide a more comprehensive evaluation of the entire Program. In conjunction with the annual status updates, the *Biennial Progress Reports* will support a macro analysis of resource investments and progress on fulfillment of Border XXI objectives. As they are developed, environmental indicators will be used to measure progress and will be incorporated into the *Biennial Progress Reports*. This will enable the two governments to detect gaps, inconsistencies, and regional disparities in Program implementation and guide development of future *Annual Implementation Plans* accordingly.

To ensure public input into this evaluation, both the *Annual Implementation Plans* and the *Biennial Progress Reports* will be publicly available. In addition, every two years, in conjunction with the release of the *Biennial Progress Reports*, the two governments will hold public meetings to foster discussion on the success of Border XXI implementation.

Active participation of the border states is central to the implementation of the Program. In the U.S., some aspects of Border XXI implementation, such as facilities permitting, are the responsibility of states under federally approved programs. U.S. state participants share responsibilities and dedicate resources to carry out implementation of the Program in the U.S. border region. In Mexico, state responsibilities include, among others, determination of tariffs, urban pavement, and vehicle inspections.

Under SEMARNAP's decentralization program (described in Appendix 5), Mexican states will have an increasingly direct role in Border XXI implementation. Therefore, both federal governments consider state environmental, natural resource, and health agencies essential participants in Border XXI implementation and will support their participation through the decentralization mechanisms described in Chapter II.

Border communities also have an important role to play in the Program. The idea behind the development of regional subgroups to the Border XXI Workgroups and other mechanisms to facilitate public involvement is to create a forum for participation of local governments, academic institutions, nongovernmental organizations, and the private sector in implementation of Border XXI at the regional level.

Diagram 1, "Strategic Planning for Border XXI," depicts the relationship between mechanisms for reporting and public involvement, and the planning and implementation process. Diagram 2 depicts the complex organizational structure through which entities of both countries participate in Border XXI.

Organization of the Border XXI Framework Document

This *Border XXI Framework Document* identifies general environmental objectives for the border region through the year 2000, and describes mechanisms and strategies for fulfilling these objectives.

Chapter II describes the strategies which will guide the efforts of the partners involved in Border XXI: public participation, decentralization of environmental management, and interagency cooperation. Chapter III identifies borderwide environmental issues, past and ongoing projects, and five-year objectives for each of the nine Border XXI Workgroups.

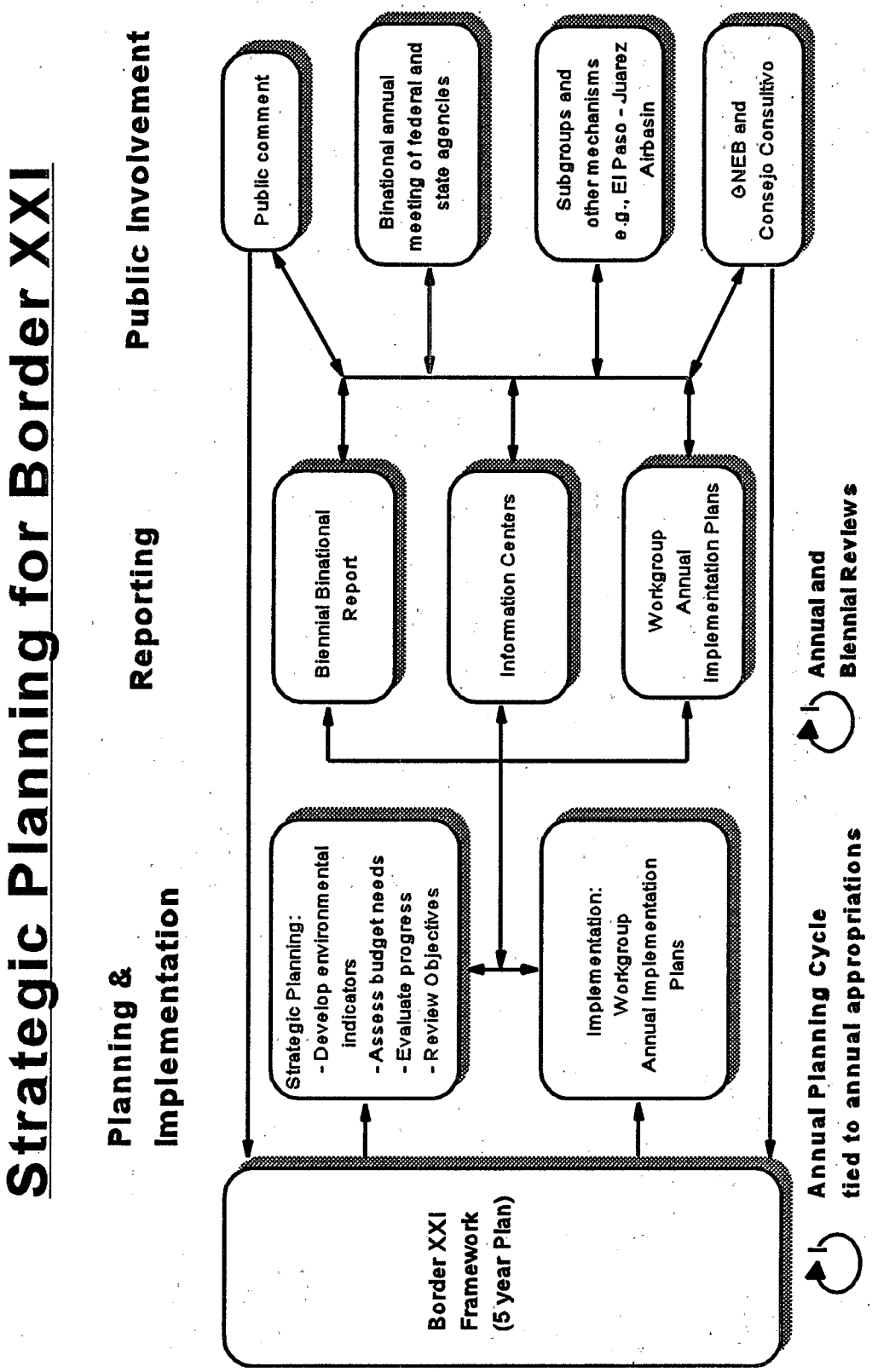
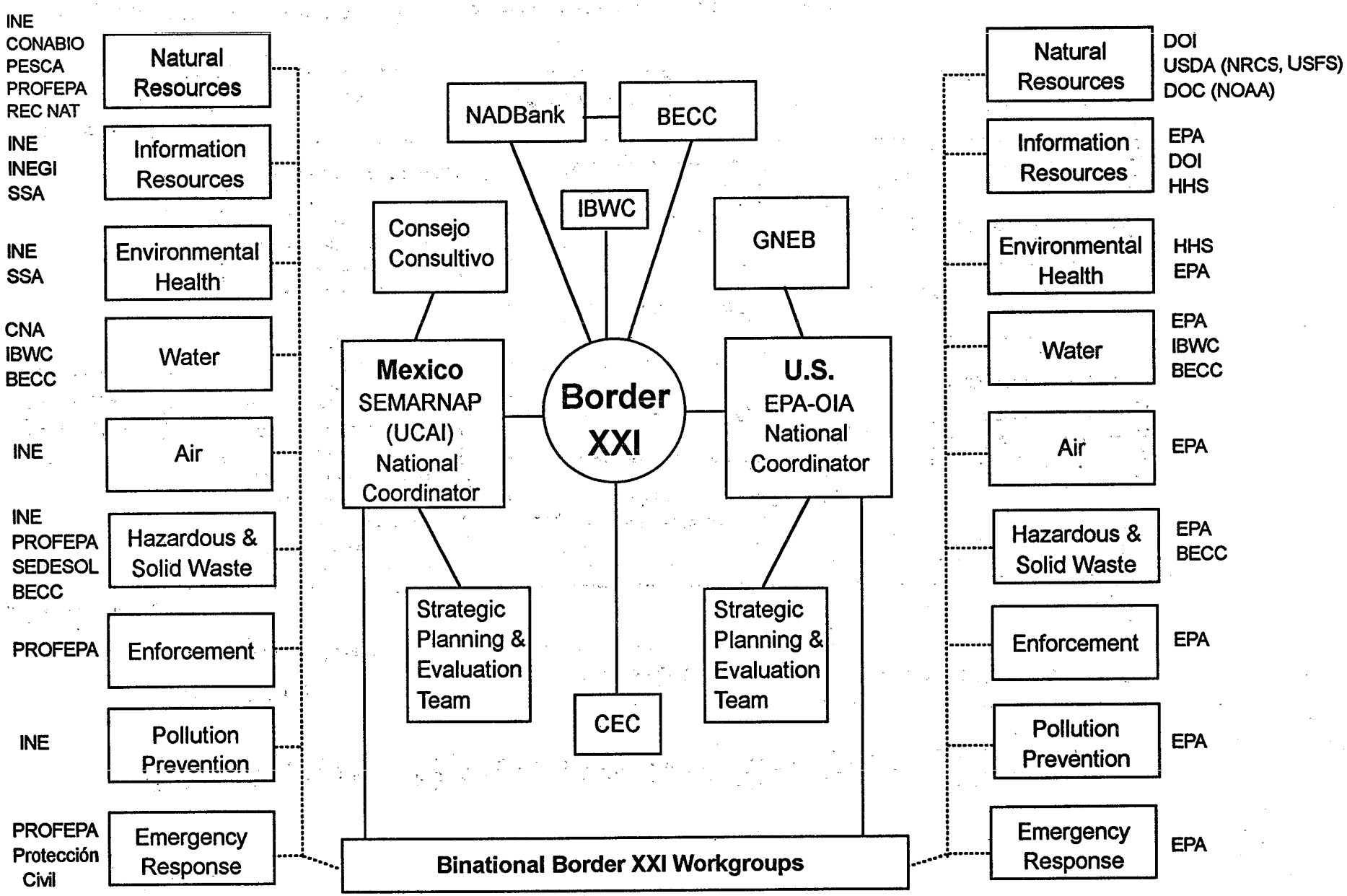


Diagram 1. The Border XXI Program promotes public involvement in program implementation

Diagram 2
Organization within the Border XXI Program



In recognition of the diversity of the border area and the need for integrated, regional planning, Chapters IV through VIII of the Framework Document are organized around five distinct geographic regions: California-Baja California, Arizona-Sonora, New Mexico-Texas-Chihuahua, Texas-Coahuila-Nuevo Leon, and Texas-Tamaulipas. These chapters describe environmental issues and problems, past and ongoing projects, and five-year objectives for each of these geographic regions.

The appendices include supplemental information on environmental agreements and international institutions that impact the border, Border XXI contacts, governmental agencies involved in the Program, financial aspects of Border XXI and social and economic considerations for the border region.

Finally, the *Border XXI 1996 Implementation Plans* are being released under separate cover in conjunction with this Framework Document.

CHAPTER II

BORDER XXI STRATEGIES

The Border XXI Program emphasizes the following strategies in advancing the goal of sustainable development:

- **Ensure public involvement** in the development and implementation of the Border XXI Program.
- **Build capacity and decentralize environmental management** in order to augment the participation of state and local institutions in implementing the Border XXI Program.
- **Ensure interagency cooperation** to maximize available resources and avoid duplicative efforts on the part of government and other organizations, and reduce the burden that coordination with multiple entities places on border communities.

Public Involvement

Both governments aim to engage the creativity, ideas, and energy of border residents in the evolution and ongoing implementation of the long-term objectives identified in this Framework Document. The border community is closest to border environmental problems and experiences the effects of degradation of the environment, environmental health, and natural resources most directly. As a result, the border community is uniquely positioned to help identify solutions to localized problems. Through input from border communities, under Border XXI, both federal governments will have better information when making decisions on how environmental resources are allocated and managed.

Environmental goals and objectives for Border XXI were developed by the federal agencies participating in the Program taking into account views expressed by the public, academic institutions, the private sector, state and local governments, nongovernmental organizations, and public advisory committees.

The public participation process included a series of domestic and binational meetings and concluded with a 45-day period of public comment on the *Draft Border XXI Framework Document*. The public comments received during the domestic and binational meetings, as well as written comments submitted to the two governments, are reflected throughout this Framework Document and will be addressed in greater detail in the *Border XXI Comment and Response Report*.

Through the initial Border XXI public comment period, the need to clearly specify mechanisms through which border communities can participate in Border XXI implementation became evident. Public involvement is a shared responsibility. On one hand, the federal Border XXI participants must establish effective mechanisms to channel public input to the Border XXI Workgroups. On the other hand, border communities must take an active role in organizing themselves to leverage those

mechanisms. To this end, Border XXI contemplates the following information, reporting, and communication mechanisms:

1. The *Border XXI Annual Implementation Plans* and the *Biennial Progress Reports* will be available to the public. In conjunction with the *Biennial Progress Reports,* the two governments will hold public forums along the border every two years. Through this process, the public will have the opportunity to suggest modifications to long-term Border XXI objectives, and ensure that the objectives reflect the changing dynamics of the border region. Public input will be compiled and summarized in a *Border XXI Summary of Biennial Public Comments.*

2. In order to allow for ongoing direct communication between the public and members of the Border XXI Workgroups, a directory which includes contact information for Border XXI Workgroup cochairs, Border XXI Workgroup staff, and regional offices involved in the Program is provided in Appendix 2.

3. The Border XXI Workgroups will explore the formation of binational subgroups or other mechanisms which will provide the Border XXI Workgroups with regional perspectives. It is envisioned that the subgroups will include, as appropriate, local and state government representatives, members of nongovernmental organizations, academia, and representatives of the private sector. These subgroups will be developed at the Workgroups' discretion and may be organized around geographic areas, specific projects, or particular issues. To date, the Air, Hazardous and Solid Waste, Cooperative Enforcement and Compliance, Information Resources, and Water Workgroups have initiated subgroups.

   In addition, the two governments have established a Joint Advisory Committee for the Improvement of Air Quality which will recommend strategies for the control of air pollution in the Paso del Norte air basin. The Joint Advisory Committee includes representatives of both local government agencies and nongovernmental organizations. The two nations will analyze the results of this effort as a model for local involvement in transboundary environmental management.

   Finally, the Border XXI Workgroups will explore additional channels for public input such as existing federal and state offices in the border region.

4. Both governments have agreed to engage the assistance of the Good Neighbor Environmental Board (U.S.) and the Advisory Council for Sustainable Development, Region 1 (Mexico) in the implementation of the Border XXI Program. At least once a year, the two advisory boards will convene a joint meeting to evaluate the progress of the Program. Both governments encourage these advisory committees to expand public involvement in their activities. Appendix 2 includes information on the membership of these advisory boards.

5. Access to information is a necessary condition for public participation and represents one of the most frequent requests of border communities. Accordingly, the Border XXI Program must offer better mechanisms for public access to information. To this end, the U.S. and Mexican governments have agreed to take a variety of domestic and bilateral actions including:

- Establishment of SEMARNAP public environmental information centers in the Northern Mexico border area. These centers will include public computer stations with Internet access.

- Establishment of public computer workstations connected to the Internet and maintenance of the toll free Border XXI information telephone line in the EPA Border Liaison Offices.

- Development of a binational environmental information and data management directory which includes available resources and general data and information generated by the Border XXI Workgroups.

These activities and objectives are discussed in greater detail in Chapter III under Environmental Information Resources.

6. Support for academic institutions can help further Border XXI objectives. The numerous research projects undertaken by universities in both countries will serve as an important contribution to the realization of Border XXI objectives. In this regard, advances in scientific knowledge should be reflected in policy and incorporated into the efforts of the Workgroups through the assistance of the Environmental Information Workgroup.

   In the past five years, the U.S. Congress has appropriated money through EPA to the Southwest Center for Research and Policy (SCERP), a consortium of U.S. and Mexican universities that develop research projects related to the border environment.[1] In addition, the U.S.-Mexico Science Foundation has undertaken academic research on appropriate environmental technologies.

   In Mexico, Program efforts will be supported by the research of institutions such as IMTA, INP, INIFAP, INE and other universities and research centers established in the border region.

7. EPA will publicize information on the availability of grants which could be applied to further Program objectives such as Border XXI community grants, (described in Appendix 7) environmental education, environmental justice, pollution prevention, and sustainable development grants. In addition, EPA and SEMARNAP will publicize the Commission for Environmental Cooperation's North American Fund for Environmental Cooperation which can support public involvement in Border XXI efforts.

Institutional Strengthening and Decentralization

Both governments recognize that, in order to further the goal of sustainable development, the authority and resources for environmental management must be located at the level of government that is closest to the community as possible. To this end, the Border XXI Program emphasizes

[1]For more information on SCERP, please see Appendix 6.

mechanisms for strengthening state and local government and decentralizing environmental management.

Sustainable development is contingent upon consideration of local issues such as water availability, needs and costs, current and future population growth, adequate infrastructure to support housing developments, and the inclusion of environmental issues and limiting factors in local and regional planning. Many of these considerations are the responsibility of state and local institutions. Federal support of these institutions and their local planning efforts will foster sustainable environmental management at the regional level.

The information and notification mechanisms established in the La Paz Agreement are part of the commitments undertaken by federal authorities in the U.S. and Mexico. Accordingly, both governments will continue to encourage direct cross-border communication between state and local authorities, with the understanding that formal agreements must be raised through DOS and SRE diplomatic channels by means of the Border XXI Workgroup Cochairs.

Current Status

- Both governments have domestic and bilateral programs in place to foster institutional strengthening. In Mexico, decentralization and institutional strengthening to support environmental management are being pursued through two avenues.

- SEMARNAP has initiated an ambitious national program of decentralization of environmental management by incorporating all of its programs into a Network which will integrate and coordinate decentralization actions. Under this Network, decentralization is conceived as a process through which political and administrative actions, as well as resources, are transferred from the federal government to state and municipal governments and, by extension, to organizations in the public and private sector. To date, participants in the Network have identified 45 federal decentralization actions. This decentralization effort will come under the legal umbrella of Coordination Agreements signed between SEMARNAP and the states. SEMARNAP will enter into Coordination Agreements with border region states this year.

In a complementary effort, since 1995, INE has been implementing a project for institutional strengthening of state and municipal environmental management in the border region. This project is part of the Northern Border Environmental Program (funded via a World Bank loan) which aims to strengthen the technical environmental capacity in the Mexican border states as well as in 10 principal municipalities. This will be achieved through personnel training, capacity building, the provision of appropriate equipment, and specific studies that will allow authorities to develop a strategy for environmental planning and management. For more details on the Decentralization Program for environmental institutional strengthening in Mexico, see Appendix 5.

Mexico's Secretariat of Social Development (SEDESOL) supports the strengthening of states and municipalities through implementation of the Solid Waste Section of World Bank loan 3752ME. The General Directorate of Infrastructure and Equipment serves as the technical agent for this effort.

Mexico's Secretariat of Health (SSA) initiated its process of decentralization many years ago and was able to establish the basis for coordination with the Mexican states. In 1996, Mexican states began to manage their own resources and health programs.

In the U.S., the federal government has delegated certain authorities to state and local governments and has increased consultations on the management and implementation of federal responsibilities. The delegated authorities are uniform and have federally established minimum requirements. Consistent with the effective implementation of its programs, EPA has retained federal enforcement authority and oversight of its delegated authorities. In addition to the delegation of many of its programs and associated resources, EPA has enlisted the direct assistance of state and local environmental authorities in the implementation of its border projects. EPA and DOJ often coordinate with state and local officials on enforcement of various laws protecting the environment. EPA and HHS have included state and local health authorities in the Interagency Coordinating Committee (ICC) for U.S.-Mexico Border Environmental Health, the federal vehicle for interagency coordination on border environmental health issues.

The USDA's Natural Resources Conservation Service (NRCS) works with locally established Resource Conservation Districts to identify and resolve conservation concerns related to soil, water, air, plant, and animal resources. In addition, USFS has a state and private Forestry staff that collaborates with state Forestry agencies, local and indigenous communities, and private landowners to manage forest and range lands beyond the USFS's boundaries. DOI, state natural resource agencies, and tribal governments have shared authority over natural resource management. Generally, the federal government is responsible for migratory species and nationally-listed endangered species, and the states are responsible for resident species of wildlife, particularly certain nonmigratory game species. The tribes have management authority of natural resources within the confines of their nations.

Finally, the BECC and NADBank are both charged with assisting state and local authorities and private sector entities in coordinating, preparing, developing, implementing, and overseeing environmental infrastructure projects in the border area through various mechanisms.

Future Activities

The U.S. and Mexico are committed to meeting the goals of institutional strengthening and decentralization of environmental management. To this end, both governments have agreed to the following:

1. Encourage state participation in all Border XXI Workgroups, as well as state and local government participation in the subgroups.

2. Convene an annual binational Border XXI meeting of policy makers from all border states and tribes charged with environmental protection, environmental health, and natural resource concerns. The purpose of the meeting will be to facilitate state and tribal input into the Border XXI Program and discuss state and tribal concerns regarding Border XXI implementation.

3. EPA, SEMARNAP, SEDESOL, IBWC, BECC, NADBank and other entities from both countries will continue cooperative efforts to reinforce environmental planning capabilities in state and local authorities, especially with respect to environmental infrastructure (wastewater, drinking water, solid waste, and road paving). Both governments will work with BECC and NADBank to deliver technical assistance to these entities for project certification and to ensure funding.

4. SEMARNAP will develop and implement the aforementioned decentralization project which attempts to bring decision-making and associated resources to the local level and foster environmental planning, implementation, and evaluation at the level of government closest to the community.

5. In the U.S., the federal government will continue to provide resources to the states to help implement Border XXI Program activities.

6. DOI has been involved in and will continue to develop international, state, and local training programs in environmental education, outreach, ecosystem management, protected areas management, resource protection, and planning for protected areas.

7. Both governments will provide access to federal research which supports state and local environmental decision-making.

Interagency Cooperation and Coordination

Border XXI brings together the efforts of U.S. and Mexican governmental agencies conducting border environmental work and strives to integrate efforts to address border environmental, natural resource and environmental health issues. This integration will create new mechanisms for problem-solving and will support the effective use of available resources as the two governments work toward the goal of sustainable development in the border region.

The creation of SEMARNAP in 1994 unified the environmental responsibilities which had previously resided in numerous federal agencies under one Secretariat, thereby enhancing efficiency in environmental planning and programs in Mexico. As a result, in Mexico, environmental protection, environment-related enforcement and inspections, natural resources management (including water), and fisheries all come under the authority of SEMARNAP (without limiting the domestic responsibilities and commitments derived from international agreements and accords by other federal agencies). This new organization has created an historic opportunity to integrate binational environmental and natural resource programs in the border region.

To improve upon this process for coordinating the multitude of federal, state, tribal, and local programs, both governments have agreed to the following domestic and bilateral actions:

1. At least once a year, both governments will organize a plenary meeting of the Border XXI Workgroups. These meetings will enable the Workgroups to review their progress, develop their Annual Implementation Plans, and exchange information about all of their programs with other Workgroups.

2. Department of the Interior will continue to utilize the U.S. Field Coordinating Committee (FCC) which is composed of representatives of seven bureaus to promote, facilitate, and enhance communications and coordination among DOI bureaus and other U.S.-Mexico federal and state entities in addressing natural resource issues at the local level along the border.[2]

3. USFS will continue to collaborate with SEMARNAP and INIFAP through research and management of resources particularly in the areas of forest and rangeland health, conservation of biological diversity, and promotion of sustainable production of forest products and services.

4. Multiagency groups work to advance natural resources on a regional scale through participation in the North American Forestry Commission. This Commission, under the auspices of the United Nations Food and Agriculture Organization, is led by forestry representatives from Mexico, Canada, and the United States.

5. HHS and SSA have signed an umbrella agreement to provide a framework for bilateral cooperation and foster collaboration in areas of mutual interest. This agreement supports existing linkages and relationships, and will facilitate future collaborative efforts in all public health areas, including environmental health. In 1995, SEMARNAP and SSA signed a cooperative agreement for research and coordination on environmental health concerns.

6. The Interagency Coordinating Committee for U.S.-Mexico Border Environmental Health (ICC) will continue to serve as the coordination vehicle between EPA and the U.S. Public Health Service (PHS) to address environmental health issues in the border area. The ICC will also continue to involve the Pan American Health Organization (PAHO) and the U.S.-Mexico Border Health Association, as well as actively engage the collaboration of SSA and SEMARNAP.

7. Several of the Border XXI Workgroups including Water, Air, Natural Resources, and Environmental Health are presently carrying out different projects related to pesticides. These Workgroups will coordinate their efforts, as necessary, to address this area of public concern. In addition, these Workgroups will build upon existing trilateral efforts in the sound management of chemicals being pursued by the CEC.

8. EPA and SEMARNAP Water and Hazardous and Solid Waste Workgroup representatives will serve as technical advisors to their respective representatives on the BECC and NADBank Boards of Directors. BECC and NADBank representatives will also participate in meetings of the Border XXI Water and Hazardous and Solid Waste Workgroups. Because of its role in solid waste infrastructure, Mexico's Secretariat of Social Development (SEDESOL) will also actively participate in these activities.

9. Improve communication between Indian tribes in the U.S. border area and the authorities designing and implementing the Border XXI Program. With support from EPA, a border area

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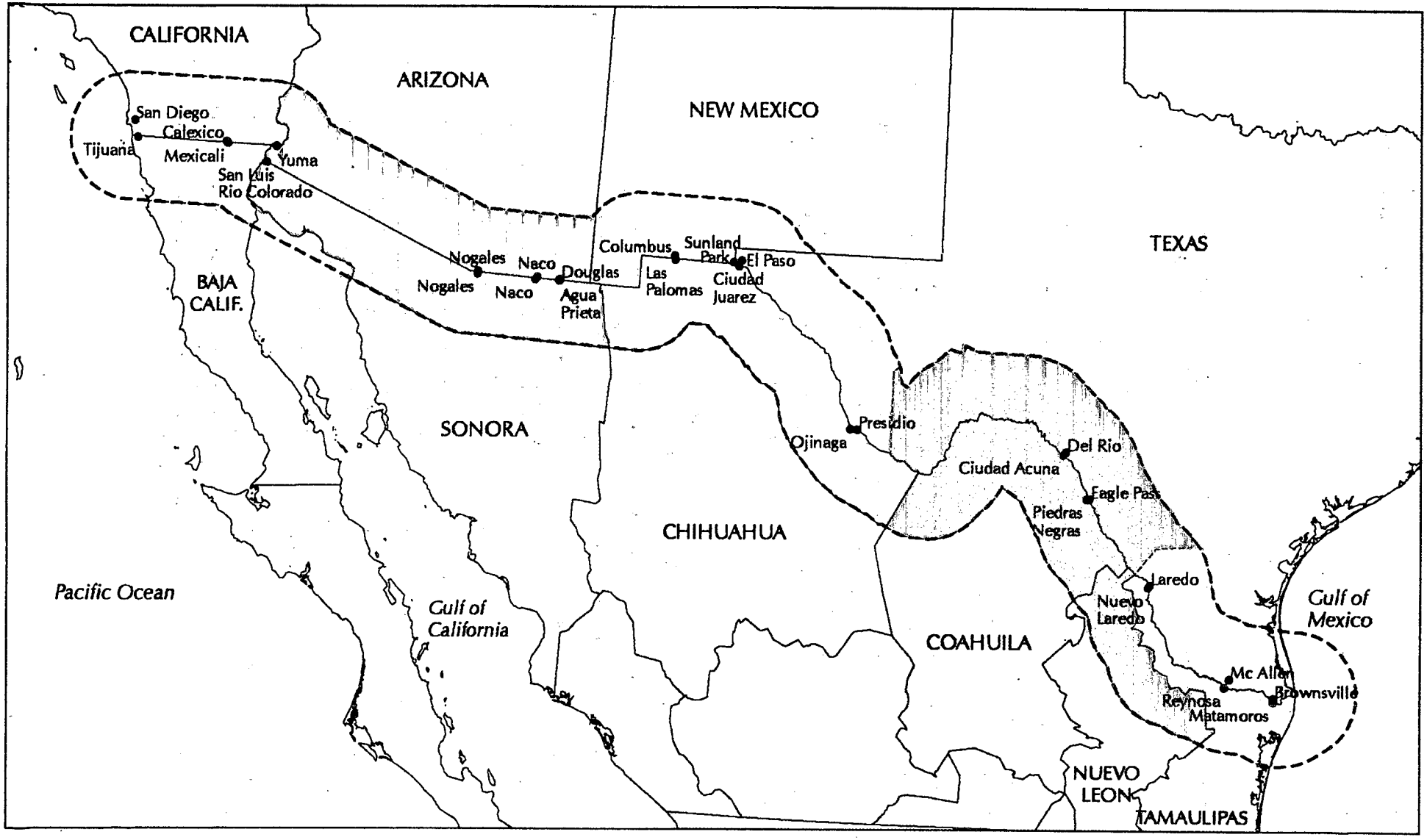
[2] The eight DOI bureaus are described in Appendix 3.

tribe is currently developing a plan to convene an environmental conference and fund attendance by all U.S. border tribes. The purpose of the tribal-led conference will be to discuss how to ensure effective integration of tribal participation into federal border environmental programs, including Border XXI implementation.

10. While not all transportation issues are within the scope of Border XXI, the Program will consider specific environmental impacts related to transportation issues through the Border XXI Workgroups. The Federal Highway Administration within the U.S. Department of Transportation is preparing, in conjunction with Mexico's SCT, a binational report on transportation. The Border XXI Air Workgroup will encourage the participation of the Federal Highway Administration, SCT, U.S. Customs, and Aduana (Mexican Customs) in its new subgroup on Congestion and Air Pollution at Border Crossings, to ensure coordination of efforts to alleviate the environmental impacts caused by congestion at ports of entry. The Contingency Planning and Emergency Response Workgroup will consider the issue of transportation of hazardous substances as a critical element of binational contingency planning.

11. While not all energy concerns are within the scope of Border XXI, the Program will consider specific environmental impacts related to energy issues through the Border XXI Workgroups. The Air Workgroup is exploring the development of a subgroup on Fuel Use Strategies to review ongoing efforts and make recommendations on ways to promote energy efficiency and the increased use of renewable energy sources. The U.S. Department of Energy (DOE) and Mexico's Federal Energy Commission will be invited to participate in the subgroup. The Information Resources Workgroup will be encouraged to identify, collect and disseminate information on energy conservation. The Pollution Prevention Workgroup will also be encouraged to incorporate energy conservation into its efforts.

U.S.-MEXICO BORDER REGION



- Sister City
- Region Boundary
- State Boundary
- 100 km Border Buffer

0 50 100 150 200 Miles

0 160 320 Kilometers

Sources:
Digital Chart of the World
La Paz 100 km Border Buffer

CHAPTER III

BORDERWIDE ISSUES AND OBJECTIVES

Overview

The border area encompasses four states in the United States (California, Arizona, New Mexico, and Texas) and six states in Mexico (Baja California Norte, Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas). There are 14 major sister city pairs along the border. The 200-kilometer wide border area is home to more than 10 million people.

Almost 90 percent of the border population lives in urban areas. For the most part, these urban areas are sister city communities composed of a U.S. and Mexican city closely related by proximity, commerce, and shared resources. The sister cities are the main points of commercial and human transboundary movement and are the industrial centers of the region. The sister city pairs are San Diego-Tijuana, Calexico-Mexicali, Yuma-San Luis Rio Colorado, Nogales-Nogales, Naco-Naco, Douglas-Agua Prieta, Columbus-Palomas, El Paso-Ciudad Juarez, Presidio-Ojinaga, Del Rio-Ciudad Acuña, Eagle Pass-Piedras Negras, Laredo-Nuevo Laredo, McAllen-Reynosa and Brownsville-Matamoros.

TABLE 3.1
POPULATION IN THE BORDER AREA

State	1990 Population	1995 Population
California	2,607,000	2,850,000
Baja California	1,401,000	2,108,000
Arizona	235,000	287,000
Sonora	395,000	440,000
New Mexico	21,000	63,000
Chihuahua	870,000	1,085,000
Texas	1,549,000	2,030,000
Coahuila	191,000	230,000
Nuevo Leon	17,000	18,000
Tamaulipas	1,015,000	1,194,000
Total	**8,301,000**	**10,305,000**

Notes for Table 3.1, Population in the Border Area:

- The 1990 information for Mexican cities was obtained from the XI National Census of Population and Housing, INEGI;
- The 1995 information for Mexican cities was obtained from the Population and Housing Count, INEGI 1995;
- The 1990 California, Texas, and New Mexico figures are from the 1990 U.S. Census;
- The 1990 Arizona figures are from the 1993 Arizona State Almanac;
- The 1995 California estimates are from the California State Government (Finance) population estimates from California Cities and Counties Report 96E-1, May 1996, projections for January 1, 1996.
- 1995 Arizona estimates are from Arizona Department of Economic Security and 1994 Rand McNally Commercial Atlas;
- 1995 figures for cities in New Mexico are estimated from the USDOC, Bureau of Census, October 1995 estimates for July 1, 1994. Texas figures are from the Texas State Data Center Estimates and Population Program prepared by Department of Rural Sociology, Texas Agricultural Experiment Station, Texas A & M University System, January 1, 1996 population estimate.
- 1995 estimates for Texas and New Mexico include estimates of people living in colonias;
- Arizona figures include the population of the Tohono O'Odham Nation, from the Bureau of Indian Affairs.

The border region is characterized by a great wealth of natural resources, stretching from the Pacific Ocean to the Gulf of Mexico. The region's highly diverse topography and climate create an incredible variety of habitats, from subtropical areas to deserts and mangrove wetlands to cloud forests. We are now beginning to appreciate the vast biological diversity that occurs in the border ecosystems of our two countries.

Over the last 30 years, this region has experienced a dramatic surge in population and industrialization. Unfortunately, this growth has exceeded the existing infrastructure capabilities of the region, leading to inadequate sewage treatment and hazardous and solid waste infrastructure, insufficient drinking water supplies, and dramatic impacts on habitats and the biodiversity they support. In addition to these pressures, increased urbanization has resulted in a significant increase in the demand for electricity. Lack of paved roads along the border has also impacted air quality. Issues related to chemical substances, such as the storage and handling of pesticides, air and water contamination resulting from pesticide use, and associated environmental health implications also pose serious environmental concerns in the border region. For an overview of social and economic factors impacting the region, please see Appendix 8.

In approaching complex border environmental issues, it is important to recognize the border area as a unique geographic, cultural, economic, and political interface of two sovereign nations. The cultures of both countries are inextricably bound by hundreds of years of history, migration, and trade. The explosion of both U.S. and Mexican artistic and literary expression which deals with the border region serves as a testimony to the unique culture which characterizes the area.

Over time, the free trade zone that has developed in the border region will provide a distinctive context for examining the effects of industrial growth on the environment, as well as on health, demographics, society, and culture. Given this situation, the U.S. and Mexico are challenged to demonstrate that economic and industrial development can coexist with a healthy environment.

In identifying borderwide concerns and objectives, this chapter presents a broader context which serves as the underpinning for the geographic chapters which follow with more specific regional objectives. The chapter is organized under nine specific topic areas that correspond to the Border XXI workgroups. Under each of these topic areas, the borderwide situation is outlined in terms of issues and problems, past and ongoing projects, and objectives for the next five years. Realization of many of these borderwide objectives will also lead to beneficial results in specific geographic areas.

Past and ongoing project tables, which appear throughout this document, are not intended to be comprehensive inventories of all activities carried out in the border region. Rather, they represent a sample of projects that serve as a foundation upon which the Workgroups will design and implement future projects. Through the development of the *Border XXI Framework Document*, the Workgroups have become aware of a vast array of important and relevant projects conducted by states, border communities, and academic institutions which they will consider in their future planning.

III.1 Natural Resources

Issues and Problems

The border region includes a vast wealth of resources and diverse ecosystems that occur in both countries. Freshwater, marine and wetland ecosystems, deserts, rangelands, and several forest types exist along the 1,952 miles (3,141 km) of international border.

Various federal and state entities, tribal nations, and other institutions share responsibility for the management of these ecosystems. In Mexico, flora and wildlife management authority, and the supervision of the use of forests, fisheries, and aquaculture rest with the federal government, while the conservation of other natural resources is shared with state and municipal authorities. In the United States, management of natural resources is shared between state and federal governments. Tribal governments within the United States have management authority for resources within the confines of their nations.

Our mutual objective is to manage and protect these resources through a coordinated binational effort to ensure their availability and enjoyment for succeeding generations. Meeting this objective will require recognition of legal mandates and authorities by the diverse entities participating in the Program.

As human populations increase on each side of the border, more demands are placed on transboundary natural resources. Examples of the threats to these resources include degradation of air, soil, and water, introduction of exotic species, habitat loss, poaching, illegal trade in protected species, increased wildfires, illegal exploitation of forest and marine resources, overgrazing, trespass livestock, and road construction. Addressing these problems requires an in-depth knowledge of biodiversity, species, and habitats which can only be obtained through scientific study, inventory, and monitoring.

Another relevant challenge we face is to communicate to border citizens the importance and necessity of wise management to ensure the sustainability of natural resources. We also need to encourage public community participation together with appropriate management authorities.

DOI and SEMARNAP have identified areas of common interest related to the border specific to selected natural resources issues in which both countries desire to continue and/or enhance working relationships. As our two countries gain experience in working together, there will be additional and increased opportunities for further cooperation in the management of other natural and cultural resources (such as historic sites).

As a result of public meetings in the U.S. and Mexico, three topic areas of interest were identified: biodiversity and protected areas, forest and soil conservation, and marine and aquatic resources. Issues and problems associated with these topics are discussed in the following sections.

Biodiversity and Protected Areas

Significant natural areas, hydrologic basins, and biological resources are common to the U.S. and Mexico. Each country is concerned about the status and distribution of biodiversity, protected natural areas, and other factors necessary to conserve biological resources along the border. Approximately 85 threatened or endangered species of plants and animals are found in the border area. These ecosystems also support more than 450 rare or endemic species. More than 700 neotropical migratory species (birds, mammals, and insects) use the borderland habitats during their annual migrations. Extirpated species from one country have often found refuge within another country. Efforts to reestablish species to their historical ranges have been possible because of this refuge and binational cooperation. Since plants and animals do not recognize political boundaries, a means to assure the continuous exchange of information and cooperative interaction is needed to help ensure their survival.

Other concerns are the possible effects of air and water pollution on flora and fauna especially in riparian habitats, and the effects of current and future land use planning for the protection of natural resources and conservation of sensitive species.

Management of protected areas in the border region is of mutual interest and concern among multiple agencies in both countries. In the U.S., these areas include national forests, national parks and monuments, national wildlife refuges, public lands, and Indian Trust lands and areas within those lands designated as cultural, historic, recreational, research, and wilderness; wild and scenic rivers; estuarine resource reserves; state parks and wildlife areas; and tribal cultural and religious areas. In the Mexican border area, these areas include biosphere reserves, flora and fauna protected areas, national parks, and national forest reserves. Protection of these areas tends to ensure the continuation of natural ecological processes, and the conservation of important cultural and historical sites in both countries, while at the same time providing a renewable and sustainable economic base for border residents.

Other problems that confront protected areas in Mexico include resource impacts from the growing number of visitors and uncontrolled human activities; the need for better coordination between federal and state agencies to further sustainable development at the local level by linking resource conservation with resource use; limited financial resources for conservation initiatives; and, up to now, the limited participation by local institutions and residents in the protection of these areas.

Forest and Soil Conservation

Long-term viability of both forest and soil resources is necessary to sustain both wildlife and border communities. In some cases, the rural economies are shifting from extractive uses to recreational uses. Both extractive and nonexhaustive uses will be necessary for future viability. Specifically, land use planning at the landscape level is needed to address issues relative to forest and agricultural insects and diseases, reforestation, genetics and silviculture practices. The health of intermingled agricultural and forest lands associated with the border is also an issue. The sustainable use of soil

and water resources is also critical for the prevention of desertification. The control and management of fires as well as use of fire as a management tool are particularly important to all associated resources. Sustainable use of these resources is hindered due to a lack of research, monitoring of research trends, and transfer of this research into management practices.

Forest and woodlands are important components of the border ecosystem, which contribute greatly to sustainability of the area. The USFS, SEMARNAP, and SAGAR-INIFAP are working together to plan for the sustainable harvest of this renewable resource, while providing for research and protection of the region's unique biological resources.

Soil and water conservation are closely related to forest and rangeland management. The NRCS, USFS, SEMARNAP, and SAGAR-INIFAP share expertise and technology in the cooperative research and management of these resources. Management issues include exotic versus native vegetation management.

Marine and Aquatic Resources

A variety of aquatic environments extends from the Gulf of Mexico to the Pacific. From east to west the area is characterized by a coastal delta and associated wetlands and lagoons; cienegas and streams course through the interior's basin and range; marine waters combine with a delta rich in biodiversity; and marine embayments can be found along the Pacific coast.

Freshwater aquatic resources vary in abundance and biodiversity along the border. When viewed within border ecosystems, these areas are rich in unique ecological assemblages. Many of the species have evolved in isolated and seemingly harsh environments. The interior mountains contain cold-water species, whereas the same streams passing through arid lowland desert biomes harbor a completely different fauna adapted to warm water and often intermittent streams. It is critical that these aquatic resources have water in the quantity and of the quality necessary to maintain their ecosystem.

The Gulf of Mexico supports a productive fishery. This productivity is largely dependent on the estuaries, embayments, wetlands and freshwater flows to the Gulf. The Gulf and its associated habitats are particularly important as breeding grounds and juvenile rearing areas for shellfish and commercial finfish.

The Alto Golfo de California has unique characteristics and a high level of biodiversity; many marine species, however, are endangered and need protection. Although the estuaries of Southern California may be small with respect to the Pacific coastal system, they are important for a variety of species. The estuaries of Southern California have a close affinity with those of northern Baja California, Mexico.

In general, many specific issues such as contamination, habitat destruction, coastal development, introduction of exotic species, and illegal harvest directly affect the marine and aquatic flora and fauna of the border region. Continued and increased support for binational efforts to provide information to characterize and manage marine and aquatic resources is necessary.

The Cooperative Fisheries Program (CFP), led by NOAA's National Marine Fisheries Service (NMFS) and SEMARNAP, provides an excellent mechanism for information sharing and joint activities relative to protection and conservation of marine species. The CFP can avoid duplication of efforts in matters specifically related to marine fisheries. Border XXI, however, could be the appropriate forum for other projects related to inland and freshwater fisheries and those projects with a small fisheries component. Information on current CFP projects is available from both NMFS and SEMARNAP.

In this regard, the MEXUS-Gulf and MEXUS-Pacific Memoranda of Understanding provide a collaborative forum for both countries to work together on their research efforts.

TABLE 3.2
NATURAL RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Conference of the U.S.-Mexico border states on parks, recreation, and wildlife	1988-1995	NPS, FWS, TPWD, INE, UACH, UAAAN, NMSU, ProFauna A.C., McAllen City Parks	Six international conferences have been held alternating between the United States and Mexico (i.e., Laredo, Texas; Saltillo, Coahuila; McAllen, Texas; Chihuahua, Chihuahua; Las Cruces, New Mexico; Ciudad Victoria, Tamaulipas).
Protected areas management training	1988-1995	NPS, INE, FWS UAAAN, ProFauna A.C.	Eight training courses on *Introduction to Protected Areas Management* have been completed for U.S.-Mexico natural resources managers.
Workshop on general management planning for natural protected areas	1989-1995	NPS, INE, FWS, ProFauna A.C.	Four specialized training courses on General Management Planning for U.S.-Mexico natural resources managers have been completed. Draft general management plans were developed as by-products of the training courses for field study sites (i.e., Cuatrocienegas, Coahuila; Ruinas Arqeologicas de la Quemada, Zacatecas; Maderas del Carmen, Coahuila; Bavicora, Chihuahua, etc.).
Key identification aids for tadpoles	1995-1997	BRD, UNAM, CONABIO, Smithsonian	A draft manuscript is in preparation.

TABLE 3.2
NATURAL RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Ecology and conservation of herpetofauna	1996	BRD, IMADES	Study of herpetofauna in the state of Sonora, Mexico
Exchange of biological data and information networks with CONABIO	1995	BRD, CONABIO	Developing cooperative mechanisms for sharing biological data and information.
Fire suppression binational response and training	1988	USFS, SEMARNAP	Development of binational fire crew from Sonora and Coronado National Forest to respond to border fires in those areas. Training in fire suppression techniques, including controlled burns and basic training in prevention and control of fires.
Transboundary Resource Inventory Project	1995	USFS, FWS, USGS, universities, NGOs, state agencies along the border	Joint measurement, mapping, and sharing of GIS information in order to create a digital base map.
Risk assessment of introduced forest pests and diseases	1995	USFS, APHIS, SEMARNAP, INIFAP, PROFEPA, FORESTRY CANADA	Develop risk assessment rating and improve identification and inspection practices along the border.
Volunteer Exchange Program	1994	USFS, SEMARNAP, INIFAP	Provide training in various forestry areas including insect and disease training, helitack training, wildlife management, GIS/GPS systems, and fire management.
Training for instructors in environmental education in the northeast zone of Mexico and production of educational materials	1995	U.S.-Mexico Joint Committee for Wildlife Conservation, Association for the Protection of Fauna, A.C., FWS, INE	Train instructors in environmental education so that they can raise awareness in communities regarding the understanding and conservation of natural resources.

TABLE 3.2
NATURAL RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Environmental education and community outreach in Mexico's northern border states	1995	U.S.-Mexico Joint Committee for Wildlife Conservation, Universidad Pedagogica Nacional Unidad Mexicali (National Educational University of Mexicali), FWS, INE	Through these programs the institutions will try to involve the communities of the northeastern Mexico border states in environmental education activities related to natural resources.
Second national CITES training course in Mexico	1995	U.S.-Mexico Joint Committee for Wildlife Conservation SEMARNAP, FWS, INE	Train personnel in the identification of CITES species, and inspection and enforcement to prevent species trafficking.
Mammals of the northern Mexican border	1995	INE, DIAAPROY, S.A. DE C.V.	A mammal list was compiled for the Mexican border area, based on the collection of scientific data from the ENCB of the National Polytechnical Institute and previous work in the area.
Biodiversity in southwestern ecosystems	1996	BRD, UNAM, CONACYT, FWS	Developing working relationships to survey and monitor biodiversity in order to provide status and trends of transboundary natural resources.
U.S.-Mexico initiative for the conservation of migratory bats	1995	U.S.-Mexico Joint Committee for Wildlife Conservation, Bat Conservation International, FWS, INE	Understand and protect these bat species that inhabit both sides of the U.S.-Mexico border.
A training course for the management of cultural and natural resources	1994	SEDESOL, INAH, NPS	Train personnel in the management of natural and cultural resources in protected natural areas.
Conservation and management of wetlands in Mexico; production of a training manual	1995-1996	U.S.-Mexico Joint Committee for Wildlife Conservation, Wetlands International, AGFD, INE	A manual is being developed for the conservation and management of wetlands.

TABLE 3.2
NATURAL RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Conservation and management of wetlands in Mexico; 1996 training course	1996	AGFD, INE, Wetlands International, U.S.-Mexico Joint Committee	The first of three annual training courses on wetland management and conservation strategies will be implemented in Merida, Yucatan, late 1996.
Training in special technical investigations for Mexican wildlife authorities	1995	U.S.-Mexico Joint Committee for Wildlife Conservation, FWS, INE	Technical studies were distributed focusing on Mexican wildlife for the authorities in the area.
Resource inventories of critical wetlands in Mexico	Ongoing	DU, DUMAC, INE, AGFD	Develop wetland inventories for three regions in Mexico; integrate data into a user-friendly system and load images, maps and databases into the system.
Study of aquatic bird gathering	1994	U.S.-Mexico Joint Committee for Wildlife Conservation, DUMAC, FWS, INE	Train technical personnel to identify aquatic birds existing in priority regions and to capture them for study.
Formation of committees of diverse members for the inspection, protection, and verification of natural resources at the state level	1995-1996	PROFEPA	The committees are instruments that incorporate social participation, commercial associations, and the state government organizations in the protection of natural resources in each of the 6 Mexican border states.
First training course regarding CITES inspection and enforcement	1995	PROFEPA, FWS, Environment Canada	Train technical personnel in the identification and inspection of CITES species.
Training course for inspectors in identifying CITES species skins	1996	PROFEPA, CWS Canada	Train personnel on the identification of skins, products, and derivatives of species included in CITES.
Population studies and habitat management guides for threatened and endangered species	1990-1996	USFS, FWS, CDFG	Habitat management guides.

TABLE 3.2
NATURAL RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Technical courses and training regarding the many aspects of verification, inspection, and protection of natural resources	1995-Ongoing	PROFEPA	Technical and legal training courses will be held for state and municipal personnel concerning inspection and vigilance of natural resources.
Observation and verification program of hunting activities relating to the Cimarron sheep, bura, berrendo, white-tail deer, and wild turkey	Ongoing	PROFEPA	Carry out this program in the northern border states to ensure compliance with hunting schedules and prevent poaching.
Formation of committees of diverse members for the inspection and protection of natural resources at the municipal level in the northern border	Ongoing	PROFEPA	The formation of these committees will be carried out in municipalities in priority regions.

Objectives for the Next 5 Years

The governments of the U.S. and Mexico have committed to maintaining biodiversity; conserving, managing, and restoring the natural resources along the border, in a sustainable manner; and strengthening regulatory compliance in the use, conservation and protection of natural resources. These objectives will be met through the coordination of the involved agencies of both countries, and the participation of the public for the benefit of the same. Specific objectives for the next five years are provided below.

Biodiversity and Protected Areas

➤ Improve and expand the protection of species and habitats in the border zone.

- Identify biological corridors that permit the free movement of species and complement conservation actions and policies for both countries.

- Identify habitats in need of protection.

- Promote the protection, conservation, and utilization of a biodiversity program in the border region through reintroduction of populations into their former range of distribution using wild brood stocks and the establishment of controlled production units as strategies for restoring threatened and endangered flora and fauna.

- Strengthen law enforcement capabilities necessary to carry out laws and agreements, the Convention on International Trade for Endangered Species (CITES), as well as illegal trafficking of wildlife and wildlife products in the border region.

- Educate communities on both sides of the border regarding the negative impacts of illegal trafficking and smuggling of wildlife and plants species across the border.

➤ Establish mechanisms for increasing the base of scientific knowledge to support improved protection and management of natural resources.

- Cooperate in the development of mutually accessible information systems, identifying status, trends, and research priorities for shared biological resources.

- Promote research and investigations of habitats and species of flora and fauna, to initiate management and protection programs that concentrate on biodiversity and the sustainable use of resources.

➤ Promote sustainable management of natural resources in the entire border zone through productive projects to improve the quality of life for local communities.

- Support the adoption of ecosystem management principles that further sustainable development in local communities.

➤ Manage natural protected areas to guarantee the conservation of ecosystems and biodiversity.

- Develop and implement management plans for all federal protected areas in the border zone and exchange relevant experiences.

- Establish and implement conservation plans for species of special interest.

- Facilitate participation from state and municipal authorities, Indian Nations, nongovernmental organizations, universities and local communities in all aspects of conservation activities.

- Establish an organizational structure and joint inspection committees for protected areas.

- Develop funding strategies to strengthen conservation activities.

➤ Design and conduct training courses and workshops regarding protected area management, protected area planning, exchange of relevant experiences among personnel from both countries, environmental education, wildlife management, legislation, and new conservation methods along the border.

- Improve binational law enforcement capabilities through cooperation and training, including implementation of international agreements on endangered, threatened, protected and rare species, and programs to combat illegal trafficking of fauna and flora.

- Ensure that proposed projects and activities that may adversely impact the use and conservation of natural resources are in compliance with environmental regulatory requirements.

Forest and Soil Conservation

- By using native species, encourage the conservation and sustainable use of forest, rangeland, soil, and wildlife resources as a fundamental part of ecosystem management through collaboration with local communities and public participation.
  - Implement programs to restore and enhance soil and forest resources through projects to improve nursery management, silvicultural practices, and soil protection with emphasis on native species.
  - Refine mechanisms for preparing, preventing, and responding to wildfires through expansion of regional collaboration and improved fire management activities.
  - Promote voluntary soil conservation programs and practices.
  - Promote reforestation in urban areas with low water consumptive plants as a method for improving air quality.

- Strengthen monitoring and enforcement with respect to forestry and wildlife uses, and land use modifications that would be in accord with the principles of sustainability. Promote verification of phytosanitary conditions of forestal species, products and byproducts during transportation, storage, and trade, with a focus on ports and border crossings.

- Continue to build and expand links between research and management of forests, rangeland and soils. Fundamental to this is promoting a consistent and compatible classification and inventory system for soils and ecosystems to better coordinate binational research activities and resource management planning with particular consideration given to land use-soil changes that lead to desertification. This can be accomplished through education, training, and by involving various disciplines in the design and implementation of these activities.

- Promote educational opportunities to local landowner and indigenous communities about non-wood products, the recreational values of forests, and the beneficial role of prescribed burning in order to maintain ecosystems in a natural balance.

- Undertake efforts to stop desertification and increase green areas by discouraging the use and consumption of certain flora, providing tax incentives to real estate owners, and restricting road construction and urban sprawl into forested or erosion-susceptible areas.

- Ensure that proposed projects and activities that may adversely impact the use and conservation of natural resources are in compliance with environmental regulatory requirements.

Marine and Aquatic Resources

- Protect, conserve, and restore marine and freshwater ecosystems and species in the border area with special consideration to endangered and threatened species and their habitats.
  - Promote mitigation of adverse impacts to coastal and freshwater ecosystems resulting from natural resource exploitation, tourism, and other human influences.
  - Prevent and reduce disease and environmental disturbances due to the introduction of exotic aquatic species, through technology transfer and cooperative research efforts.
  - Promote and encourage legal compliance relative to agrochemical usage to prevent water and soil degradation and reduce impacts to aquatic resources.
  - Monitor aquacultural enterprises to enforce permit compliance, prevent water degradation and increased soil salinity, and diminish environmental impacts on aquatic habitats.
  - Regulate and enforce marine and freshwater sport fishing activities.
- Promote sustainable aquaculture development while preventing habitat degradation and declines in resident species.
  - Promote compliance with domestic regulations for the protection of interior, coastal, and ocean fisheries.
  - Cooperate to control illegal trafficking of species and illegal use of aquatic resources.
- Initiate training, educational programs, and outreach activities that support marine and aquatic resources through cooperative investigations, exchange of technology and improved user access to data.
- Strengthen compliance with existing legislation and regulations regarding fisheries and aquaculture with the end goal of protecting aquatic biodiversity.

III.2 Water

Issues and Problems

Surface water resources in the border area include two major river drainages, the Colorado River and the Rio Grande. Other important river systems include the Tijuana River, New River, Alamo River, Gila River, Santa Cruz River, San Pedro River, Rio Yaqui, Rio Casa Grande, Rio Conchos, Pecos River, El Diablo River, Rio Salado, and the Rio San Juan. These surface water resources are

complemented by numerous groundwater basins, which feed important wetland areas that support biodiversity and the region's natural systems.

Water pollution is one of the principal environmental and public health problems facing the border area. Deficiencies in the treatment of wastewater, the disposal of untreated effluent, and the inadequate operation and maintenance of treatment plants result in health risks to border communities. Additionally, the lack of adequate treatment and distribution systems for drinking water constitutes a potential exposure risk for, among other things, gastrointestinal infections. In some cases raw or insufficiently treated wastewater is discharged or flows to surface and groundwater drinking water sources in urban and rural areas. In the Rio Grande, for example, raw wastewater is often discharged upstream from drinking water intake works. Nitrate contamination also poses a threat to rural water supply.

Along the Mexican side of the border, there are 23 cities with a total population on the order of five million inhabitants. In these cities, 88 percent of the population has access to drinking water, and 69 percent has access to sewage collection systems. The capacity of the treatment plants within these cities is 34 percent of total need. It is worth noting that the sewer systems in the majority of the cities are very old and have exceeded their useful life, thereby requiring rehabilitation. The greatest need is for water and wastewater infrastructure in the urban areas; however, a need also exists in small communities.

The waters in streams that form the international boundary are allocated to the two countries by treaties administered by the International Boundary and Water Commission (IBWC). The waters in streams that cross the boundary or in underground basins that straddle the international boundary, while not allocated at this time, are the subject of consultations between the United States and Mexico under consultative mechanisms, also administered by the IBWC. Finally, United States and Mexico under those treaties have assumed rights and obligations for the international waters, administered by the IBWC governing flood control, joint use, water quality, new and modified uses of waters, and preservation of the boundary rivers through floodplain regulation.

The distribution in each country of allocated or unallocated waters is administered by applicable laws of each country. In the United States, the Congress has authorized compacts for the allocation among the states of surface waters of the Rio Grande and the Colorado River. In such cases, the U.S. Bureau of Reclamation is responsible for the control and storage of allocated waters through federally-constructed storage and regulation dams. The U.S. Army Corps of Engineers manages flood control dams in these river systems. Further, each state has legislation assigning ownership of water rights for specific uses, and governing the use of surface and ground waters. Finally, each state has its own legislation that enables municipalities and quasi-public entities to develop, finance and operate the infrastructure necessary for the use of these waters for municipal and industrial purposes and in agriculture.

In Mexico, the use and regulation of waters is administered by the Comisión Nacional del Agua (CNA). Under recent law, CNA also is leading efforts to develop basin-wide planning councils governing the quality and use of surface and ground waters.

Strong budget restrictions limit the investments in water infrastructure in Mexico. In addition, the operating entities on the Mexican side of the border require significant subsidies for the provision of

services due to the fact that user fees are insufficient to cover the cost of operation and maintenance, and a lack of public awareness regarding water conservation issues results in inefficient water usage.

In the U.S. border area, all the sister cities are serviced by public drinking water authorities that are required to meet the drinking water standards of the Safe Drinking Water Act. In addition, the vast majority of U.S. municipalities have EPA-permitted publicly owned treatment works, and new housing developments cannot be approved unless they are connected to a locally approved septic system or an EPA-permitted treatment system. The major exceptions to this situation are existing 'colonias' or unincorporated communities lacking basic public services. In the U.S. border area, there is a great need for water and wastewater infrastructure in the colonias and small communities. It is estimated that over 390,000 people live in Texas colonias and over 42,000 live in New Mexico colonias. Texas and New Mexico have both passed laws which now prohibit the development of such communities without basic sanitary and municipal infrastructure.

The United States and Mexico under the 1944 Water Treaty monitor both the quantity and quality of the international streams and have developed programs for additional monitoring, including toxic substances, pesticides, salinity and sediment transport. Further, the United States and Mexico will enhance the process for consultations when an action or project of one country has a potential environmental impact on shared natural resources.

An amazing abundance and diversity of wildlife, both migratory and resident species, are found in the border region and are dependent upon a limited supply of water. This same water is necessary to sustain the growing human population. The development of a comprehensive understanding of the quantity and quality of water resources that are present in the region is critical to the selection of conservation and management alternatives. Any future water supply studies should include multi-purpose use including fish and wildlife needs.

The systematic and consistent collection and analysis of water resources data can generate the hydrologic information and knowledge needed by water managers along the border. In turn, these data can be used to conduct water resource appraisals in which the occurrence and availability of surface and ground waters and their physical, chemical, and biological characteristics can be described on a binational basis. The collection, synthesis, and analysis of hydrogeologic data are important in establishing and evaluating water resource protection strategies and policies and supporting related environmental baseline studies. Due to the transboundary nature of water issues, it is important that efforts to characterize water resources be international in scope. In order to alleviate water-resource problems and provide a greater understanding of hydrologic systems sufficient to predict their response to natural or human-caused stress, basic applied hydrologic research is necessary.

Binational agreements exist for monitoring the quality of principal water bodies. Within these agreements, the detailed study of salinity, flows, and transport of sediments in the lower Colorado River Watershed is of vital importance.

In the context of wastewater treatment, the U.S. and Mexico have established bilateral agreements which determine that wastewater treatment in each country will be guided by the respective national standards. Mexico is adapting its regulations and standards regarding wastewater discharges, considering the water uses of the receiving bodies, instead of regulating the discharges from sources.

In this sense, the new official Mexican standards will contemplate incremental compliance of the quality of water that is discharged to receiving bodies.

Along the border, there are a large number of entities with potentially overlapping functions. Therefore, increased communication, cooperation, and coordination among responsible parties, which acknowledges the different statutory authorities of each country, is needed.

The Water Workgroup recognizes the need to interact on a continuing basis with other Border XXI workgroups, particularly the Natural Resource Workgroup, to maintain an awareness of each other's needs and to work collaboratively when appropriate.

Past and Ongoing Projects

From 1989 through 1995, through the efforts of CNA, Mexico completed many planning studies and project designs in the areas of drinking water, sewer systems, sanitation, and the institutional strengthening of operating entities. This information is outlined in Table 3.3.

TABLE 3.3
NUMBER OF COMPLETED PLANNING AND DESIGN STUDIES

State	General Planning	Drinking Water Design	Sewer Systems Design	Treatment Systems	Institutional Strengthening
Baja California	10	13	9	3	
Sonora	8	6	4	2	2
Chihuahua	4	1	2	2	
Coahuila	4	2	2	2	1
Tamaulipas	13	10	7	7	3
Total	39	32	24	16	6

To date, borderwide activities pertaining to water programs have basically involved wastewater infrastructure funding, training courses for utilities operators, and water quality studies. Specific infrastructure and water quality monitoring projects are discussed in more detail in the appropriate geographic chapters. Table 3.4 identifies past and ongoing borderwide projects related to water issues.

TABLE 3.4
WATER
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Pretreatment inspector training	1992	EPA, SEDUE	SEDUE staff accompanied EPA staff during pretreatment inspections in Southern California.

TABLE 3.4
WATER
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Wastewater treatment inventory	1993	EPA, IBWC	Binational inventory of wastewater systems in the border area.
Drinking water inventory	1994-1996	EPA, IBWC, CNA	Binational inventory of public drinking water systems in the border area.
Translate pretreatment manuals	1995-1996	EPA, WEF	Draft manuals due summer 1996: Local Limits Guidance, Industrial User Inspection & Monitoring and Industrial User Permitting Guidance.
Industrial Wastewater Pretreatment Program training	1994-1995	EPA, IBWC, CNA	Course provided to wastewater technicians in Ciudad Juarez and Mexicali.
Identification of water data needs for border characterization	1995-1997	EPA, DOI, IBWC, CNA, INEGI	Inventory of information gaps and development of strategy for addressing them.
Surface water data collection and analysis network	1979-1997	USGS, other federal agencies; state and local agencies	Long-term database on stream flow, sediment and water quality data.

In support of environmental infrastructure development, the U.S. and Mexico created the NADBank to finance infrastructure for water, wastewater, and solid waste. To date, both governments have capitalized the NADBank for a total of U.S. $1,275 million in callable capital and U.S. $225 million in direct capitalization.

The Border Environment Cooperation Commission (BECC) was created to collaborate with state and municipal authorities, national and international institutions, and with private investors to help prepare, develop, implement, and oversee environmental infrastructure projects located in the border region. The BECC analyzes the technical, environmental, social, financial and economic feasibility of projects as well as community participation and project sustainability prior to the certifications of projects. Projects certified will be presented to the NADBank or other financial institutions. The Water Workgroup will support the BECC by providing guidance regarding environmental conditions and water resources at risk.

Through September 1996, the following eight projects have been certified by the BECC, whose total costs are approximately U.S. $91 million as reflected in Table 3.5.

TABLE 3.5
PROJECTS CERTIFIED BY THE BECC THROUGH SEPTEMBER 1996

Location	Type of Project
Ensenada, Baja California	wastewater treatment plant
Nogales, Sonora	drinking water supply
FINSA, Matamoros, Tamaulipas	wastewater treatment plant
Brawley, California	drinking water supply
Douglas, Arizona	sewer networks
El Paso, Texas	water reuse
El Paso, Texas, EPISO	wastewater treatment to colonias
Naco, Sonora	drinking water supply and wastewater collection and treatment

Under the Northern Border Environmental Program (NBEP), Mexico has an agreement with the World Bank for a credit of U.S. $368 million to support environmental development of the cities in the northern border area, of which U.S. $80 million is for drinking water and sanitation projects.

Objectives for the Next 5 Years

The two countries, pending available resources, will focus the Water Workgroup's efforts on the following objectives during the next five years:

- Develop and, when necessary, rehabilitate drinking water, wastewater collection, and wastewater treatment infrastructure.
  - Streamline EPA-SEMARNAP-IBWC-DOI cooperation, where appropriate, to develop integrated plans that will include analyses of water infrastructure projects and technical, economic, financial, and social feasibility studies. The effort will assist the operating entities in complying with the BECC certification criteria to secure financing.
  - Increase institutional coordination to make decision-making more efficient and optimize available resources.
- Pollution Prevention
  - Establish binational guidelines for developing pretreatment programs, and implement pretreatment programs in accordance with each country's standards for industrial wastewaters discharged into the municipal collection system and the treatment plants whose effluent is discharged to common watersheds.
  - Work with the Pollution Prevention Workgroup to assist industries in reducing discharges of pollutants to municipal wastewater collection systems.

- Watershed Planning and Management
  - Pending available resources, establish binational priorities and develop a long-term joint program, through DOI, EPA, IBWC, SEMARNAP, in cooperation with state and local authorities, to systematically map and characterize key transboundary surface and groundwater basins.

- Water Quality Monitoring
  - Continue, and, if necessary, expand the programs for monitoring the quality of surface and ground waters, including salinity and sediment transport, where appropriate to characterize and determine the status of and changes in water resources.
  - Water data along the border will be collected and stored using recognized collection and analyses protocols approved by USGS and/or EPA and/or CNA.

- Training and Development
  - Develop personnel training and development programs related to water management issues.

- Efficient Water Use
  - Develop consciousness about water and promote its efficient and rational use.
  - Promote water reuse and conservation.

- Public Participation
  - Promote public participation in decision-making related to water infrastructure as well as acceptance of public responsibility with regard to these projects.
  - Encourage cross-border communication at the federal, state and local government levels.

Resource Requirements

In Mexico's northern border region, investment needs totaling approximately U.S. $442.3 million for improvement of the level of water services over the next five years have been identified. These funds will be invested according to relative priorities, the availability of resources at federal and state levels, and ability to pay on the part of the water users. These investment needs are distributed as shown in Table 3.6.

TABLE 3.6
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Drinking water	38.0	46.0	48.0	132.0
Sewer systems	32.0	41.0	48.0	121.0
Treatment	51.0	34.0	28.0	113.0
Consolidation	15.0	11.0	4.0	30.0
Increased efficiency	15.0	12.0	14.0	41.0
Studies and projects	3.3	1.6	0.4	5.3
Total	154.3	145.6	142.4	442.3

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

To support the operating entities of the Mexican border localities, CNA contemplates making investments in these local authorities to improve plant operations as well as increase technical capacity and financial efficiency. CNA has identified the facility planning and design requirements for the next three years at a total cost of U.S. $5.5 million.

In 1995, EPA received nearly $150 million for border environmental infrastructure projects: $50 million for colonias, $52.5 million for construction of the South Bay Ocean Outfall (part of the Tijuana International Wastewater Treatment Facility), $37.3 million for wastewater infrastructure planning and construction in Imperial Valley-Mexicali and Nogales-Nogales, $200,000 for water quality monitoring, and $10 million for wastewater infrastructure planning for projects along the Rio Grande-Rio Bravo.

In fiscal year 1996 EPA received $150 million for border environmental infrastructure and U.S. colonias. EPA plans to use these funds for several purposes: a) constructing current EPA-assisted projects; b) providing technical assistance to BECC; c) constructing BECC-certified projects in combination with other funding sources; d) providing assistance to indigenous communities; and e) providing assistance to small communities. Refer to Appendix 4 for detailed information on funding distribution.

III.3 Environmental Health

Issues and Problems

Human health and the environment are inextricably linked. The border area is characterized by heightened public health concerns as a result of a variety of demographic, economic, and environmental factors.

Conditions which present challenges to the environmental health of border communities include the following: rapid urbanization without commensurate development of health and environmental infrastructure; increased industrial/manufacturing development and the attendant occupational risks; changing age demographics as a result of migration producing increases in the number of young, working adults and children; the poverty under which a high percentage of residents live; lack of sufficient drinking water supplies of adequate quality; inadequate treatment and disposal of domestic and industrial wastewater, domestic solid and hazardous waste, and industrial wastes; and improper handling and storage of pesticides.

The border region is confronted with several serious public health problems that are or may be associated with toxic environmental exposures. Contamination of air, water, and soil by heavy metals, volatile organic compounds (VOCs) hazardous materials and waste, pesticides, nitrates, raw sewage, untreated wastewater, parasites, and/or bacteria are suspected to be key factors contributing to the presence of certain diseases in the populations residing along the border. These could include respiratory diseases, particularly asthma and tuberculosis; elevated blood lead levels in children; multiple myeloma, a form of bone-marrow cancer; systemic lupus erythematosus (SLE), an autoimmune disorder; hepatitis A; infectious gastrointestinal diseases such as shigellosis and amebiosis; and pesticide poisonings.

Efforts to address these issues are complicated by the absence of adequate environmental monitoring and health surveillance mechanisms to document the extent of these problems, lack of available health services in the community, and insufficient environmental training and education within the health and medical professions, as well as the general community, to anticipate, recognize, understand, and address these conditions.

In 1993, HHS and EPA established the Interagency Coordinating Committee for U.S.-Mexico Border Environmental Health (ICC) to address these concerns. The ICC was sanctioned formally through the signing of a Memorandum of Understanding between EPA and HHS in the spring of 1995. The ICC is composed of federal and state environment and health officials and Pan American Health Organization representatives. Building upon efforts previously undertaken by HHS, EPA, and border state agencies, the ICC will continue to work to better identify and address, in a coordinated fashion, the priority environmental health needs of the area. The ICC defines environmental health as human health influenced by exposure to chemical, physical, and biological agents in the community, workplace, or home. A program strategy which defines a blueprint to guide long-term planning and priority-setting has recently undergone ICC review and has been provided to Mexico's health ministry, SSA, for comment.

In Mexico, a similar process is being implemented. SEMARNAP and SSA have signed a detailed national agreement on joint efforts related to the generation of information, investigations, auditing and control of environmental and health risks. SSA has designed programs and defined action steps for the decentralization of environmental health in the border states. The implementation of these programs will be a major emphasis in the immediate future.

Currently, the ICC is increasing coordination with SSA and SEMARNAP. The two countries have agreed to promote activity on environmental health issues by encouraging members from each country's health and environment authorities to work closely together and with their respective communities to create and implement solutions and improve the quality of their services. It is also

important to promote environmental health through various communication media and disseminate information on environmental health activities to other Border XXI Workgroups and border communities. Both governments view the ICC and SSA as the principal mechanisms for implementing environmental health solutions on the border. Close coordination between health and environmental agencies will assist in identifying priorities, evaluating mutual progress, and enhancing collaboration in related activities. In this context, environmental health efforts also will be coordinated with the other Border XXI Workgroups as well as key international entities such as PAHO, BECC, and CEC.

TABLE 3.7
ENVIRONMENTAL HEALTH
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
U.S.-Mexico border health data infrastructure	Ongoing	HRSA, CHDS, EPA, health departments in border states, USMBHA	Pilot project to improve health data infrastructure for disease surveillance and monitoring risk factors.
FDA Market Basket Survey	Completed	FDA, EPA, TDH, CDHS, ADHS	Provide database on levels of nutrients, pesticides, and metals in diet including sampling of community-specific items in 3 border cities.
Evaluation of hispanic NHANES database	1995-1996	EPA, CDC	Resurrect and validate this database as a reference dataset (e.g., levels of metals and pesticides in biological fluids) for current/planned studies.
Neural Tube Defects Program	Ongoing	PAHO, EPA, CDC, health departments in border states	Establish process/program to share binational surveillance data on NTDs as results of epidemiological investigations.
Birth Defects Registry	1994-1997	Border states, SSA, PAHO	Establish process/program to share binational surveillance data on NTD as a result of epidemiological investigations.
Cancer Registry	1992-1997	Mexican border states, SSA	Morbidity-mortality specific database.

TABLE 3.7
ENVIRONMENTAL HEALTH
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Communications/ training/education projects	Ongoing	Multiple	Support U.S.-Mexico Border Health Association and similar meetings. Provide bilingual information and training opportunities to enhance community awareness and self-directed actions.
	1994-1995	ATSDR, PAHO	Sister city public environmental health training courses.
	1993-1995	ATSDR, state and local health departments	Environmental emergency preparedness. Guidance on treatment/transport of persons with acute exposures.
	1984-Present	ATSDR, ADHS, CDHS, TDH	Preparation of public health response to community petitions and identified border hazardous waste sites.
	Ongoing	NIH, NIEHS, Rural Coalition, CONACYT	Binational workshop on farmer families and environmental justice.
	1996-1997	SCERP, ASU, Red Fronteriza, El Colegio de Sonora, EPA	Model for training community environmental health advisors.
Analysis of toxic metals in retail food	1995-1997	SCERP, UTEP, Universidad Autonoma de Ciudad Juarez, EPA	Determination of health risks in commonly used foods and cookware.

Objectives for the Next 5 Years

The parties involved in the Border XXI Environmental Health Workgroup seek to increase binational collaboration between environmental and public health entities to improve the health of border communities. These collaborative efforts will improve the ability to identify and address those environmental conditions that pose the highest health risks. The goal is to address environmental health concerns so as to reduce exposures and other factors associated with disease rates along the border. To this end, the following objectives have been defined:

- Improve the capacity of state, tribal, and local health and environmental agencies to assess the relationship between human health and environmental exposures by conducting surveillance, monitoring, and research.

- Improve the capacity of state, tribal, and local health and environmental agencies to deliver environmental health intervention, prevention, and educational services.
- Increase the opportunities for stakeholders on the border (e.g., individuals, communities, institutions/organizations and occupational groups) to participate in environmental health initiatives.
- Improve training opportunities for environmental and health personnel.
- Improve public awareness and understanding of environmental exposure conditions and health problems by providing information and educational opportunities.

III.4 Air

Issues and Problems

Many border residents are currently exposed to health-threatening levels of air pollution. Ozone, particulate matter, carbon monoxide, and sulfur dioxide are among some of the air pollutants of concern in the border region.

EPA and Mexico's Instituto Nacional de Ecologia (INE) have developed national strategies to improve air quality that are centered around basic sets of national ambient air quality standards. Both countries have established similar ambient air quality standards for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter of 10 microns or less in diameter (PM-10), and lead (Pb). Appendix 9 includes a summary of the health effects of these contaminants. Table 3.8 compares the Mexican and U.S. health-based ambient air quality standards.

TABLE 3.8
COMPARISON OF U.S. AND MEXICAN HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

POLLUTANT	MEXICO		U.S.	
	Units	Average	Units	Average
O_3	0.11 ppm	1 hour	0.12 ppm	1 hour
SO_2	0.13 ppm 0.03 ppm	24 hours annual arithmetic mean	0.14 ppm 0.03 ppm	24 hours annual arithmetic mean
NO_2	0.21 ppm	1 hour	0.25 ppm 0.053 ppm	1 hour annual arithmetic mean
CO	11 ppm	8 hours	9 ppm 35 ppm	8 hours 1 hour

TABLE 3.8
COMPARISON OF U.S. AND MEXICAN HEALTH-BASED AMBIENT AIR QUALITY STANDARDS

POLLUTANT	MEXICO		U.S.	
	Units	Average	Units	Average
TSP	260 μg/m3 75 μg/m3	24 hours annual geometric mean	Not Applicable	Not Applicable
PM-10	150 μg/m3 50 μg/m3	24 hours annual arithmetic mean	150 μg/m3 50 μg/m3	24 hours annual arithmetic mean
Pb	1.5 μg/m3	3 month arithmetic mean	1.5 μg/m3	3 months

Table 3.9 lists border cities that exceed ambient air quality standards. Currently in Mexico there is no guidance by which to determine "nonattainment" with Mexican air quality standards. Additionally, there is insufficient air quality monitoring data to determine if Mexican cities meet the Mexican air quality standards. Aside from these limitations, Table 3.9 indicates various Mexican cities that potentially do not meet the Mexican air quality standards based on knowledge of sources and their potential emissions.

TABLE 3.9
BORDER CITIES THAT EXCEED AMBIENT AIR QUALITY STANDARDS

BORDER NONATTAINMENT AREAS[1]	PM-10	SO_2	CO	O_3
El Paso, Texas	x		x	x
Dona Ana County, New Mexico	x			x
Imperial County, California	x		~[2]	~[3]
San Diego, California			x	x
Douglas, Arizona	x	x		
Nogales, Arizona	x			
Yuma, Arizona	x			
Tijuana, Baja California	x		x	x
Mexicali, Baja California	x		x	x
San Luis Rio Colorado, Sonora	x			
Nogales, Sonora	x			
Agua Prieta, Sonora	x	x		
Ciudad Juarez, Chihuahua	x		x	x

[1] Mexico is currently in the process of defining procedures and criteria for determining official attainment or nonattainment status.
[2] Currently designated as "unclassifiable/attainment," although last year there were 11 violations. Based on 1994-95 data, design value would be 12.9 ppm ("high" moderate).
[3] Currently designated as "transitional" nonattainment for ozone. Based on 1993-1995 data, the county's design value would likely be .16 or above (serious).

Border air quality problems are due to emissions from mobile, point and area sources driven by economic growth in the region. The size of the vehicle fleet in Mexico is increasing and many cars are obtained from abroad. This impacts air quality as a large portion of these cars do not comply with auto emission standards because they have been poorly maintained and contain after-market, used, or inappropriate replacement parts. In addition, authorities have been unable to perform adequate planning and design of roadways to allow free flow and movement of traffic, which likewise contributes to the deterioration of air quality.

Another problem of importance is the large amount of pollution produced by mobile sources (cars, trucks, buses) at the border crossings, since large vehicle lines form during peak crossing-hours. The problem is compounded by the poor condition of the vehicles and the extended idling times required to cross into U.S. cities. This produces noticeable air pollution.

With respect to point sources, industrialization has accelerated with the increased location of industrial operations in the border zone. In combination, the maquiladora sector and national industry emit significant quantities of a variety of pollutants from the combustion of fuel and fugitive emissions from their industrial processes. The area is experiencing additional air pollution from service and commercial activity that accompanies industrial growth.

Finally, the rapid urbanization and resulting lack of infrastructure to support growth results in the creation of large stretches of unpaved roads that contribute significantly to particulate matter in the air, further reducing air quality. There are numerous other area emissions sources including residential fuel combustion, waste disposal (refuse burning), fires (wild fires, prescribed burning, structural fires), agricultural production, brick manufacturing, wire reclamation, and manure burning.

Annex V to the La Paz Agreement directs the U.S. and Mexico to assess the causes of and develop solutions to air quality problems in border sister cities. Given the increase in population, vehicular traffic, and industrial activity in the El Paso-Ciudad Juarez-Sunland Park, San Diego-Tijuana, Imperial Valley-Mexicali, ambos Nogales and Douglas-Agua Prieta air basins, there is an immediate need to evaluate levels of targeted air pollutants. Other areas may likely be added to this list as needs arise.

In particular, the Air Workgroup will build on the existing efforts of its geographically specific subgroups to promote regionally based air quality monitoring networks, emissions inventories, and regional air quality modeling and improvement strategies. These air quality improvement strategies will serve as useful tools for local decision-makers as they grapple with the interrelationships among air quality, land use, transportation and economic development. The Workgroup will work in close partnership with U.S. and Mexican state and local governments, indigenous communities, private sector, academia, and NGOs in managing the air quality in the region. For example, bilateral agreement was reached to establish a Joint Advisory Committee for the Improvement of Air Quality which would recommend strategies for the prevention and control of air pollution in the Paso del Norte air basin.

TABLE 3.10
AIR QUALITY
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Air quality programs in priority sister cities. The workgroup is focusing on three priority areas over the long term: San Diego-Tijuana, Imperial Valley-Mexicali, and El Paso-Ciudad Juarez-Sunland Park. In addition, short-term studies are underway in other areas (e.g., ambos Nogales, Douglas-Agua Prieta)	Ongoing	EPA, INE, border state and local governments	Through the Air Workgroup, the two governments are working together to address air quality through emission inventory development, monitoring and air pollution abatement strategies. These efforts include components for training, technical assistance and public participation.
Training needs assessment and referral Build the technical capacity and expertise in Mexico to deliver needed air quality management training in an efficient and coordinated manner.	Ongoing	EPA, INE, UAM, UTA, border state and local governments	Finalized assessment of air quality training needs for five cities along the border. Regional training centers have been opened in Tijuana and Ciudad Juarez and a third center is planned for Matamoros. In process of developing repositories for training materials and resources within the training centers. Provide access to satellite courses through EPA-sponsored Distance Learning Network. Developed procedures for course development and delivery. Established train-the-trainer programs. Developed and delivered in Mexico City and Tijuana a training course on control of particulate pollution.

TABLE 3.10
AIR QUALITY
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Air Emissions Inventory Methodology Project Provide foundation for development of consistent industrial, area, and mobile source inventories for large urban centers of Mexico	Ongoing	INE, EPA, WGA, local governments	Developed proposed methodology for emissions inventory. Prepared training course materials and emissions inventory development manuals. Delivered course in Ciudad Juarez and plans are underway to deliver course in Tijuana. Two manuals have been finalized (basic emissions inventory techniques, point sources). Preparing mobile and area source manuals. Identified technical studies including special studies and refinement of emissions inventory methods testing, validation of emissions estimates, emissions factor applicability to Mexico, and uncertainty analysis. Pilot testing methodology in Mexicali.
U.S.-Mexico Information Center on Air Pollution (CICA) Developed and operating an information center for the border area to provide access to pertinent information related to assessment of air pollutant emissions, ambient monitoring, air quality modeling, and control technologies and pollution prevention programs that will aid in the achievement of emissions reductions.	Ongoing	INE, EPA	Continue to provide technical assistance to Mexican government and private sector. Current projects include 1) Spanish translation of air quality dispersion models; 2) development of ambient monitoring plan for Ciudad Acuna; 3) development of emissions estimation techniques for unique source categories in Mexicali; and 4) emissions and prevention/control techniques for auto body shops in Ciudad Juarez. In addition, the clearinghouse will make available a wide variety of information (e.g., air monitoring data) through a bilingual hot-line (919-541-1800) and an Internet home page: http://www.epa.gov/oar/oaqps/cica.html.

Objectives for the Next 5 Years

Over the course of the next five to ten years, both nations hope to be in a position where we have developed and are implementing air quality improvement strategies along the U.S.-Mexico border, with the ultimate goal of meeting the health-based ambient air quality standards of each nation. In order to meet this goal, EPA and SEMARNAP have agreed to focus the efforts of the Workgroup on the following objectives during the next five years.

- Develop air quality assessments and improvement programs:
  - Evaluate levels of targeted air pollutants through regionally-based air quality monitoring networks.
  - Determine the source of the pollutants through the development of emissions inventories.
  - Load information into computer models which calculate pollutant concentrations throughout the area.
  - Compare the model's theoretical computations with the actual measured values obtained from the monitoring networks and adjust the model.
  - If necessary, perform additional modeling computations, based on the emission inventory, source emission profiles, and statistical "fingerprinting" methods ("source attribution"), which can be used as important aids in determining the most efficient and cost-effective control strategies.
  - Conduct air quality modeling with future year emissions, considering population growth and potential impacts of control strategies to predict future ambient air quality concentrations and associated health risks. Analyze air quality impacts of alternative control strategies.
  - Based upon analyses, recommend air quality improvement strategies to attain health-based air quality standards.
- Continue to build institutional infrastructure and expertise in the border region:
  - Provide technical assistance in the development and implementation of control strategies.
  - Continue to build the necessary institutional infrastructure and expertise in the border region to deliver air quality management training in an efficient and coordinated manner. Training courses will be developed in Mexico City as well as the border states and municipalities and delivered at training centers located in Tijuana, Ciudad Juarez, and Matamoros (additional training centers may be added as needs arise).
  - Continue to provide and improve as necessary the technical assistance and information dissemination efforts of the U.S.-Mexico Air Pollution Clearinghouse.

- Encourage ongoing involvement of local communities. The Air subgroups will meet with interested parties on a geographically specific basis to discuss projects and solicit suggestions on ways to better facilitate information dissemination and community involvement in air quality improvement strategies.

- Review and recommend implementation of air pollution abatement strategies that do not require extensive technical evaluations (e.g., promote turnover of gross polluting vehicles, reduced automotive vehicle emissions related to idling at border crossings, reductions in emissions from high emitting auto paint and body shops, curtailed open trash burning, lessened emissions from high emitting residential heaters, and lowered emissions from brick kilns).

- Study the potential for economic incentive programs for reducing air pollution more quickly and at less cost than conventional "command and control" methods that require specific technologies and/or emissions reductions. These evaluations will present the economic and environmental advantages/disadvantages in both the U.S. and Mexico in terms of applying such programs in a transboundary context.

- With the anticipated increased industrialization of the border area, it is desirable that the U.S. and Mexico have a mechanism by which each country is informed early regarding plans for construction of a significant new or modified air polluting source within the international border zone. The Binational Air Workgroup will explore development of a notification protocol to address this issue.

- The Binational Air Workgroup will pursue the development of an exploratory subgroup on fuel use strategies to review ongoing efforts and to make recommendations on ways to promote energy efficiency and the increased use of renewable energy sources. The subgroup will need to involve the participation from a wide variety of governmental (e.g., EPA, DOE, INE, PEMEX, CFE, state, local) and nongovernmental entities (e.g., private sector, NGOs, academia).

- The Binational Air Workgroup will pursue the development of an exploratory subgroup on congestion and air pollution at border crossings to review ongoing efforts and to make recommendations on ways to alleviate regional air pollution problems caused by vehicular congestion at ports of entry. The subgroup will need to involve the participation from a wide variety of governmental (e.g., EPA, INE, Customs, DOT, state, local) and nongovernmental entities (e.g., private sector, NGOs, academia).

III.5 Hazardous and Solid Waste

Issues and Problems

In the border, rapid industrialization and the associated increase of population have created a need for improved hazardous and solid waste management infrastructure. Some of the specific waste issues that have been identified by federal and state agencies, as well as the general public, include the illegal transboundary shipment of hazardous waste; improper disposal of hazardous and solid

waste; health and environmental risks posed by inactive and abandoned sites; the need for proper development of new sites; and the proper operation and closure of existing sites.

The Hazardous and Solid Waste Workgroup undertakes projects and activities that promote sound waste management practices. An overarching goal of the Workgroup is to build improved capability along both sides of the border to develop and implement waste management programs. Other primary goals of the Workgroup are to improve the monitoring of transborder movements of hazardous wastes and toxic substances, and to promote pollution prevention and waste reduction practices. The Workgroup seeks to involve key local, state, and federal officials from both countries in its activities.

The Workgroup recently changed its name from the Hazardous Waste Workgroup to the Hazardous and Solid Waste Workgroup. This change was made with the acknowledgment that hazardous and solid waste management and disposal issues often present similar concerns and challenges to environmental and regulatory officials along the border. In addition, the U.S. and Mexico have differing definitions of hazardous and solid waste, thereby increasing the need to develop common approaches to both hazardous and solid waste management.

Bilateral agreements ensure that the two countries coordinate and share information on hazardous and solid waste facilities along the border. Under the *U.S.-Mexico Consultative Mechanism for the Establishment of New Sites and for Existing Sites*, agreed to in June, 1992 by the U.S. and Mexico, both countries will continue to notify each other of proposed facilities "which store, treat, or dispose of hazardous, toxic, radioactive, or solid waste and which are required to be permitted, licensed, or approved by federal, state, or local authorities."

In March 1996, the Interministerial Group on Hazardous Waste Disposal Sites for the U.S.-Mexico border was formed in Mexico with the purpose of issuing joint statements on new hazardous waste facilities and to develop programs for compliance and monitoring of existing sites. This group is composed of INE, PROFEPA, CNA, the Coordinating Office of International Affairs of SEMARNAP, the Secretariat of Energy, the National Commission for Nuclear Security and Safeguards (CONASENUSA) and SRE.

TABLE 3.11
HAZARDOUS AND SOLID WASTE
PAST AND ONGOING PROJECTS - BORDERWIDE
(Please see Appendix 10 for additional U.S., state, and local solid and hazardous waste projects)

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Outreach and training to maquiladoras on regulatory requirements for transborder shipments of hazardous waste	1988-1993	EPA, SEDESOL, TNRCC, NMED, US and Mexican Customs, DOT, National Maquiladora Association, SCT, Cal-EPA, ADEQ	Six borderwide conferences were held to increase understanding by maquiladoras and U.S. parent companies of import/export regulations. Developed bilingual manual for the maquiladora industry.

TABLE 3.11
HAZARDOUS AND SOLID WASTE
PAST AND ONGOING PROJECTS - BORDERWIDE
(Please see Appendix 10 for additional U.S., state, and local solid and hazardous waste projects)

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Further develop and expand binational computerized tracking system for transborder movement of hazardous wastes and substances (HAZTRAKS)	1992-Ongoing	EPA, SEMARNAP, States	Improved binational monitoring of hazardous waste movements. Improved binational enforcement of import/export regulations.
Binational development of information on detection of illegally imported/exported hazardous waste	1992-Ongoing	EPA, SEMARNAP	Establishment and enforcement of guidelines for the repatriation of hazardous waste illegally exported or imported.
Exchange information on siting of new and existing hazardous, radioactive, or solid waste facilities along the border	1992-Ongoing	EPA, SEMARNAP, States	Adopted consultative mechanism to ensure information exchange on a quarterly basis.
Produce preliminary plan and environmental evaluation for solid wastes in Tijuana and Ensenada, B.C., Juarez, Chih., San Luis Rio Colorado, Son., Matamoros and Reynosa, Tam.	1993	B.M., SEDESOL	Identify the needs for solid waste infrastructure for protection of the environment.
Integrated diagnosis and study of environmental impacts of a sanitary landfill in Mexicali, San Luis Rio Colorado and Piedras Negras	1993, 1994	SEDESOL, municipal governments	Determine implementation plan for pilot projects and equipment for the solid waste sector.

TABLE 3.11
HAZARDOUS AND SOLID WASTE
PAST AND ONGOING PROJECTS - BORDERWIDE
(Please see Appendix 10 for additional U.S., state, and local solid and hazardous waste projects)

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Publication of technical and administrative manuals for appropriate management and final sanitary disposal of municipal solid wastes	1995	SEDESOL	Improve the administration and management of municipal solid wastes in cities.
Improve hazardous waste field sampling and lab analysis capability (including creation of mobile lab units)	1995-Ongoing	EPA, SEMARNAP, State	Improved ability to detect violations of hazardous waste management and import/export regulations.
Provide solid waste reduction assistance to maquiladora industry in San Diego-Tijuana region (Border Waste Wi$e)	1996	EPA, San Diego, Tijuana, Cal-EPA	Solid waste reduction trainings held and waste assessments conducted at maquiladoras. Waste reduction manuals developed for maquiladoras.
Establish binational recycling market development zones (RMDZ) in San Diego and Tijuana.	1996	EPA, San Diego, Tijuana	Data on recycling sources, markets, and relevant customs regulations in San Diego-Tijuana region. Creation of RMDZ in Tijuana to parallel San Diego RMDZ.
Utilize regional geographic subgroups to implement Hazardous and Solid Waste and Cooperative Enforcement and Compliance Workgroup objectives	1996-Ongoing	EPA, SEMARNAP, states, and local authorities	Develop and implement region-specific projects with the binational subgroups.

TABLE 3.11
HAZARDOUS AND SOLID WASTE
PAST AND ONGOING PROJECTS - BORDERWIDE
(Please see Appendix 10 for additional U.S., state, and local solid and hazardous waste projects)

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Inventory of hazardous waste generation and inventory of management infrastructure	1996-Ongoing	EPA, SEMARNAP, states	Identify facilities and determine amounts of wastes generated.
Workshops on California and Mexico requirements for importers and exporters of hazardous waste	1996	Cal-DTSC, EPA, U.S. and Mexico Customs, DOT, San Diego and Imperial Counties, SECOFI, SDSU, INE, PROFEPA, SCT, Secretariat of Health	Two workshops were held in San Diego and Imperial to increase understanding of California and Baja California industries on requirements involved with importing and exporting hazardous wastes.
Inventory of solid waste landfills	Ongoing	EPA, TNRCC	Pursuant to EPA grants, an inventory of active solid waste landfills along the border was conducted. Training on landfill design, operation and closure was provided to Mexican officials and landfill owner/operators.
Assessment of illegal dumps	Ongoing	EPA, TNRCC	TNRCC is evaluating the scope of illegal dump problems and assessing collection/disposal needs.

Objectives for the Next 5 Years

EPA, SEMARNAP, and SEDESOL have agreed to focus the efforts of the Hazardous and Solid Waste Workgroup on the following objectives over the next five years.

- Develop a vulnerability atlas for the U.S.-Mexico border to target geographic priorities for solid and hazardous waste management activities.

- Improve monitoring of the transboundary movement of hazardous wastes and substances in the border region:
  - Maintain and improve the HAZTRAKS system.
  - Attempt to correlate the definitions of "hazardous waste" between the two countries.
  - Provide training to, and work cooperatively with, U.S. and Mexican Customs officials.
  - Coordinate development of HAZTRAKS with other international tracking systems.

- Maintain inventory of hazardous waste generation and management infrastructure.

- Use the information contained in HAZTRAKS to improve regulatory compliance and identify needs for hazardous waste management infrastructure.

- Assess application of the TransHaz Electronic Data Interchange system for electronic transfer of documents related to the movement of hazardous waste.

➤ Continue enforcement activities related to illegal hazardous waste practices:

- Deliver training to enhance capabilities in regulating hazardous waste.

- Continue to repatriate illegally exported/imported hazardous wastes.

- Review and improve the repatriation guidelines.

- Improve monitoring of the movement and generation of hazardous waste.

- Continue to conduct inspections at the U.S.-Mexico border crossings for illegal shipments of hazardous waste.

➤ Improve waste management practices and promote solid and hazardous waste minimization and recycling:

- Develop partnerships with industry to encourage waste minimization and safe material management.

- Provide site-specific compliance and technical assistance on an as-needed basis.

- Train government officials, community leaders, and industry on waste reduction and pollution prevention.

- Create laboratory capability in the border region to address equipment needs, sampling methods and training of personnel, including development of mobile laboratories.

- Continue to promote, through SEDESOL, integrated solutions for the management and disposal of solid wastes in sanitary landfills and the closure of open dumps. To that end, publish and disseminate technical and administrative manuals and promote the closure and/or upgrading of open dumps.

➤ Build institutional expertise and capability:

- Exchange technical information regarding the criteria for the design, construction, operation and monitoring of waste facilities in the border area, including minimum requirements for siting of waste facilities by both countries in the border zone.

- Continue to exchange information on waste facilities in the border area in accordance with the *U.S.-Mexico Consultative Mechanism for the Establishment of New Sites and for Existing Sites.*

- Identify and address training needs and implement training courses for environmental regulatory officials, industry, customs and transport officials from both countries.
- Develop closer coordination with the BECC and the CEC to help target projects and priorities.
- Utilize regional geographic subgroups to implement the Hazardous and Solid Waste Workgroup objectives.
- Conduct training courses at all levels of government involved with the management and operations of municipal solid waste sites.

III.6 Contingency Planning and Emergency Response

Issues and Problems

The fundamental purpose of the Contingency Planning and Emergency Response Workgroup is to increase municipal and local capacity to prepare for and respond to hazardous material emergencies and optimize the use of U.S. and Mexican resources in environmental emergencies. A key element of contingency planning and emergency response is the involvement of the public and local officials in the development of strategies to implement safeguards for preventing or controlling hazardous situations. The Workgroup has met with communities on a geographic sister city basis to discuss strategies and solicit suggestions on ways to better facilitate information dissemination and community involvement.

The Workgroup coordinates binational activities through the Joint Response Team (JRT), established under Annex II to the La Paz Agreement. One of the most significant steps the Workgroup has taken in the past several years is the expansion of the JRT to include all federal, state, and local entities responsible for contingency planning and emergency response activities on both sides of the border. Previously, the JRT had included only representatives from EPA and SEMARNAP. In addition, the JRT is near completion of the Revised U.S.-Mexico Joint Inland Contingency Plan (JCP) which is a federal plan to protect human health and the environment by providing for coordinated responses to chemical accidents affecting the border region. The JCP is to include U.S.-Mexico Sister City Plans as they are completed. The main focus of the work by the JRT was, and continues to be, to assist state and local officials and the public in the development of joint sister city plans to be better prepared to mitigate the effects of chemical accidents along the border. This work is being accomplished by providing support to the local cities (i.e. sister cities) to identify the hazardous chemical risks present in their community and reduce those risks.

One area of concern raised in the Border XXI public outreach meetings is that the planning has focused on sister city areas. This leaves out large areas which are not major population centers, but where there still may be a risk of a hazardous incident because of increasing cross-border traffic (i.e., trucks carrying loads of hazardous materials through Indian reservations or isolated roads that are short cuts that traverse small communities).

Another area of concern surrounds issues of cross-border mobilization of personnel and equipment to ensure that appropriate resources are available during a hazardous materials emergency. A U.S.-Mexico subworkgroup under the Joint Response Team has been created to address and quickly resolve these issues. The overarching focus of the Contingency Planning and Emergency Response Workgroup for the next five years will be to identify the hazardous chemical risks in the border area and implement a program including necessary resources to address those risks.

TABLE 3.12
CONTINGENCY PLANNING AND EMERGENCY RESPONSE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Formation of the Expanded Joint Response Team (JRT)	1994	PROFEPA, EPA, and all appropriate federal, state, and local agencies	Federal, state, and local entities responsible for contingency planning and emergency response activities on both sides of the border accepted the expansion of the JRT in 1994.
Revisions to the Joint Contingency Plan (JCP)	1996-1997	JRT Members	At the last JRT meeting in March 1996, changes were made to the original JCP and will be presented to the remaining federal, state, and local officials for their review and approval.
Development of protocols and notification procedures	1996-1997	PROFEPA, EPA	Will address adequate procedures to coordinate with National Response Center in the U.S. and National Communication Center in Mexico.
Promote CLAM/LEPC cooperation in the development of hazardous materials inventories and in participating in contingency planning	Ongoing	PROFEPA, EPA	These groups have information on the key hazardous materials present at the border and the JRT will work to support and provide assistance to these groups on a continuous basis.
Workshops and training courses in Calexico-Mexicali, McAllen-Reynosa, and Eagle Pass-Piedras Negras.	1996	ICMA, EPA	Technical assistance workshops for sister cities, for emergency prevention, preparedness, and response.

Objectives for the Next 5 Years

The Workgroup will work to complete revision to the binational Joint Contingency Plan. In addition, it will work with the sister cities to develop binational plans for each of the 14 sister cities in the region. It will explore ways to solve the issues raised by states and locals including ways to reduce the barriers to the free movement of equipment and personnel across the border (in both directions) in times of response to chemical emergencies. Specific objectives over the next five years include the following:

- Implement and complete the following pending activities: joint contingency plan, notification system, procedures for quick mobilization of transboundary emergency response personnel and equipment, and a pilot project with CAMEO (Computer-aided Management of Emergency Operations), a computer system jointly developed by NOAA and EPA.

- Create an Emergency Response Center in each neighboring city, with adequate computer equipment and chemical substances databases.

- Acquire mobile units equipped with protective suits for chemical substances, and devices for measuring explosivity, toxic gases, etc.

- As a pilot project, establish a Communication Center in one sister city for fast and effective response to notification of an incident that requires the help of the other country and thus notify organizations that they should respond to the emergency.

- Promote the creation of and coordination between Local Emergency Planning Committees (LEPCs) in the U.S. and Local Committees for Mutual Assistance (CLAMs) in Mexico in developing the information on hazardous materials inventories in computer databases.

- Integrate a specialized team of emergency response personnel and prepare training and simulations for the Response Center, the Communications Center, and for the management of the mobile units.

- Create a fund for maintenance of the Response Center, the mobile units, the Communication Center, and for the training of specialized and other involved personnel.

- Initiate communication to the public about chemical risk in the area in an effort to create public awareness and to increase public participation in contingency planning.

- Train personnel currently involved in actual emergencies and subsequently train additional personnel in the Response and Communication Centers.

- Exercise and test annually the established procedures for cross-border notification and response systems for all emergencies that activate the international system.

- Government officials in both countries will work to remove impediments - legal, political and liability issues - related to emergency response, including compensation from responsible parties.

- The issue/incident-specific Joint Response Team (JRT) will be responsible for effective implementation of the Inland Plan on a regional level in the U.S. and on a state and local level in Mexico in accordance with the policies of the JRT and the JCP.

- Encourage industrial facilities to make use and storage of chemicals information and inventories available to local response officials, and provide response equipment and assistance in the event of a chemical emergency.

III.7 Environmental Information Resources

Issues and Problems

The explosion of data and information on the border environment represents the increased attention placed on border environmental issues by government agencies, academic institutions, nongovernmental organizations, the private sector, and border residents. It also reflects the challenges posed by the information age. The two governments have established the Environmental Information Resources Workgroup to respond to this situation.

A recurring theme raised by the public on both sides of the border during the Border XXI public meetings was the need for increased public access to a wide variety of environmental information presented in a form that is comprehensible and serves the needs of the different users. Public information requests range from the results of technical studies to curriculum for elementary schools. In order to successfully respond to the public's strong desire for increased access to information, the two governments must first determine the types of environmental information that are currently available.

While a tremendous amount of information about the border environment has been collected and generated by a variety of interests, currently there is no comprehensive inventory of existing border environmental data and information. It is critical that the U.S. and Mexico systematically identify and inventory past and ongoing federal and state government efforts and programs to collect information on the border environment. Given the lack of such an inventory, information gaps and duplicative efforts are inevitable. A comprehensive inventory will enable the governments to identify and address the most urgent information needs, and effectively foster cooperative rather than redundant efforts in the future.

Cooperative efforts are contingent upon the development of effective mechanisms to facilitate communication and information sharing within and among the Border XXI Workgroups. The Environmental Information Resources Workgroup is committed to developing an organized approach to information management, to encourage horizontal linkages, and to working with the other Border XXI Workgroups to institutionalize effective communication and information sharing. To this end, each Border XXI Workgroup will be designating a liaison to the Environmental Information Resource Workgroup. These liaisons will aid in the facilitation of communication among the Border XXI Workgroups, and will address the dissemination of information issues relevant to the implementation of the U.S.-Mexico border programs. Such horizontal representation will ensure that workgroup communication is automatically cross-fertilized, and will help maintain frequent and fluid information exchange.

The two governments recognize that certain types of information serve as foundational elements on which other efforts can build. To this end, the two governments are working toward the development of compatible geospatial data standards for use in applications such as GIS. The two governments will also look at environmental indicators which will serve as fundamental tools for measuring whether environmental policy is addressing the most urgent border environmental problems. The Environmental Information Resources Workgroup, in collaboration with the Strategic Planning and Evaluation Team, will ensure that the other workgroups are aware of these initiatives and have input into their development and access to their products.

The Geospatial Data/Geographic Information Systems (GIS) subgroup will address and resolve binational geospatial data and GIS issues relevant to the U.S.-Mexico environmental border programs. A steering committee composed of federal, state, and local representatives will begin to address these geospatial data concerns. This committee will be responsible for the oversight and coordination of numerous geospatial data and GIS themes and will support issue identification and resolution with the Border XXI Workgroups.

One of the major concerns expressed by border communities, as well as by the Border XXI Workgroups, is the need for mechanisms to evaluate the effectiveness of border environmental policy. To this end, the development of environmental indicators which allow for effective assessment of both achievements and obstacles to progress that result from the application of such policies is essential. Environmental indicators will serve as a basis for analysis of implementation efforts, and as an important tool for dissemination, to the public, of information on progress.

TABLE 3.13
ENVIRONMENTAL INFORMATION RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE[1]

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Common information system architecture	1995-Ongoing	EPA, SEMARNAP	Established local area network in the EPA attache's office in U.S. Embassy in Mexico City.
Public access	1995-Ongoing	EPA	Compendium of EPA Binational and Domestic U.S.-Mexico activities available on EPA home page.
Lotus Notes development	1995	EPA, SEMARNAP	Lotus Notes installation to key personnel in EPA and SEMARNAP.
GIS database development	1995	EPA (R6 & R9)	Common TIGER92 based Arc/Info Library for the border region.
GIS database conversion	1994	EPA (R6 & RTP)	Conversion of DMA/DCW database to Arc/Info format.
GIS database development	1993	EPA R9	Acquired SPOT imagery for California border region.

TABLE 3.13
ENVIRONMENTAL INFORMATION RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE[1]

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Directory of Spatial Datasets to support environmental research along the U.S.-Mexico border	1995	SDSU, EPA, SCERP	An inventory of United States and Mexican agencies along the California- Baja California segment of the border: steps toward a Regional Data Cooperative.
Integrated cross-border GIS for the Imperial Valley-Mexicali Valley interface	1996-1997	SDSU, El Colegio de la Frontera Norte, EPA, SCERP	Development of comprehensive GIS for Mexicali-Imperial valleys as a tool for public and private industries.
An integrated cross-border GIS for the San Diego-Tijuana interface	1992-Ongoing	SDSU, COLEF, EPA	Initial GIS database development for the San Diego - Tijuana region.
GIS for environmental health	1995-Ongoing	ADHS, ADEQ, CDHS, NMBHO, TDH, UTEP, TRIP	A GIS database inventory for the Arizona border region of possible databases to be integrated for environmental health GIS projects.
Arizona-Sonora Biosphere Reserve - GIS	1994-Ongoing	Arizona-Sonora Desert Museum, CES, TRIP	Initial step to provide a mechanism to exchange data information via the Internet with a focus on cultural sensitivity index and endangered species.
El Paso del Norte - GIS	1995-Ongoing	UTEP, El Paso City Planning, Ciudad Juarez, IBWC, New Mexico Bureau of Mines, JMAS, CNA, TRIP	Initial steps to prepare a binational GIS to address environmental concerns focusing on air/water quality and health in the El Paso-Ciudad Juarez-Las Cruces region.
Laguna Madre - GIS	1995-Ongoing	ITESM, TGLO, UT, DUMAC, UAT, TRIP	Initial steps to prepare a binational GIS to address environmental concerns in the Laguna Madre area with a focus on coastal issues.
Tijuana River Watershed - GIS	1994-Ongoing	SDSU, COLEF, NOAA, USGS, EPA, SCERP, USFS	Initial development of GIS for Tijuana watershed.

TABLE 3.13
ENVIRONMENTAL INFORMATION RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE[1]

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Texas-Mexico Borderlands Data and Information Center	1994-Ongoing	TWDB/ TNRIS	Established a center at TNRIS, the state data clearinghouse agency, to deal specifically with border data, expand data holdings and inventory border datasets. Secured services of Mexican national GIS professional through UTA.
Water-related GISs along the U.S.-Mexico border	1993	EPA/OW	Compiled and published information on 26 GISs along the border.
GPS location of state-EPA regulated facilities	1994-1996	UTA-BEG, EPA R6	During year 1 over 700 sites were accurately located using real-time GPS. Year 2 priorities: complete El Paso, Hidalgo County, TX and Dona Ana, NM. TRI, PCS and CERCLIS.
GIS/GPS workshop for UT-El Paso Wellhead Protection Program	1996	EPA/R6, TNRCC, UTEP, UNT	Develop and present 3-day workshop to UT-El Paso Wellhead Protection project staff (students). Topics are GIS basics, GPS and hands-on GIS analysis.
Border state-EPA data sharing partnerships	TIGER 90: 1994-1995 TIGER 92: 1996	EPA/R6, TNRCC, TWDB, TNRIS, NMED, others	Provide base TIGER GIS datasets and technical training on dataset use to primary state environmental agencies and state data clearinghouse agencies.
Border XXI presentations to state GIS coordinators	1996	EPA/R6, TX-GISPC, NM-GIC, TRIP	Present overview of Border XXI Environmental Information Resources Workgroup to state GIS planning and coordination groups. Participate in efforts to identify and fill border data gaps.
U.S.-Mexico aerial photography initiative	1995-1996	SEMARNAP/INEGI, DOI/USGS, EPA, IBWC, CEC, Texas, CEQ, DOS	Provide color infrared aerial photography for entire U.S. portion of border region. Color infrared and B/W photography for the Mexico portion of the border region.
Update and revise all USGS standard map products in the border region	1995-Ongoing	USGS, DOI INEGI, CEQ, DOS, IBWC, Texas	DOQs, DRGs, DEMs, and DLGs; 2581 quads within the border region to be produced or updated within the next 5-7 years.

TABLE 3.13
ENVIRONMENTAL INFORMATION RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE[1]

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Improve availability and monitoring of biological resources and coordinate methodologies	1995-Ongoing	BRD, CONABIO, Smithsonian	Agreement signed and held workshop on NBII. Initiated information exchange of existing collections information, inventories, and monitoring.
Baseline Indicators Workshop	Sept 1995	USEPA, SEMARNAP	Initial phase of the development of key environmental indicators and a comprehensive inventory of programs that involve the collection, management, and dissemination of border environmental data.
El Paso-Ciudad Juarez Pilot Project	1995-1997	INEGI, USGS	Demonstrate the ability to share and translate digital geospatial data between the U.S. and Mexico.
GIS development	1996-1997	U. of Utah, SCERP, EPA, SDSU	Application of GIS database for identification and modeling of agricultural contamination affecting regional groundwater in Mexicali-Imperial valleys.
Education and training	Ongoing	NM State U, U of NM, NM Institute of Mining & Technology, and other partners	Under sponsorship of DOE, DOD, EPA and others, a program of college level education at all degree levels has been established. A program called the Environmental Fellows Program has been established to provide graduate level education to emerging leaders from Mexico. Ten fellows from Mexico have already graduated from this program. A design contest is conducted annually that provides practical hands-on education to universities from all of America, including Mexico. Courses are available on a regular basis by interactive TV. (A training program has also been established that addresses all hazardous waste issues, including regulations and transportation.)

TABLE 3.13
ENVIRONMENTAL INFORMATION RESOURCES
PAST AND ONGOING PROJECTS - BORDERWIDE[1]

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Rio Grande Watershed Information Needs Survey Workshop	1996	TRIP, FGDC, TGLO,UT, Pan-American Tamaulipas University	Identification and review of needs relating to information standards between public, private, and academic institutions.
Development of information capacity for state and local Tamaulipas government	1996	Secretaría de Desarollo Social de Tamps, INE, World Bank, EPA, TNRCC	Under its state decentralization plan for equipping and building capacity to operate information management programs.

[1] Some of these projects were initiated prior to the formation of this workgroup.

Objectives for the Next 5 Years

Through the efforts of the Environmental Information Resources Workgroup, both governments hope to develop a systematic approach to the collection and dissemination of border environmental data and information. The Workgroup has agreed to the following objectives:

- Establish an inventory of environmental information for the border region:
  - Along with the border communities, the Workgroup will create an inventory of all existing border environmental information with the aim of defining information gaps, eliminating duplication, encouraging the exchange of capabilities between electronic systems, and facilitating the general information produced by nongovernmental organizations.
  - Establish an environmental information directory which includes relevant institutions, experts, projects, investments, and sources of information on both sides of the border.
  - Identify common border environmental information sources and methodologies and establish mechanisms to efficiently house this information by employing existing meta-data type methodology to further categorize the information for easier access.
  - Work with the Border XXI Workgroups to clearly document information collection, analysis methods and specific datasets (main applications).
- Create effective mechanisms for sharing information with government agencies and among Border XXI Workgroups:
  - Establish compatibility of information channels, and assure some connectivity between the environmental information systems of the two countries. Develop compatible data standards for collection and dissemination of information.

- Exchange technology methodologies to ensure the execution of common system infrastructure.

- Facilitate general communication and information exchange by establishing communication infrastructure through the development of a consistent and centralized collaborative platform. This platform will accomplish the following:

  - establish electronic connectivity among government agencies and the Border XXI Workgroups and enhance and incorporate connectivity with binational organizations;

  - serve as a medium for the Border XXI Workgroups to provide progress reports and updated activities; and

  - house information on border projects and activities.

➤ Improve and increase public access to information:

- Establish regional environmental information databases to focus on the most important border environmental needs of specific border communities and disseminate this information to the respective communities.

- Draw on the collaborative platform to publish selective information on border projects and activities via the Internet for public access. Not all information from the collaborative platform will be made publicly available as each government must follow its own confidentiality procedures before information is released for public access.

- Devise a variety of nonelectronic mechanisms for the dissemination of environmental information including hard-copy production of public information available from the collaborative platform for inclusion in border information centers and repositories.

- Establish public Environmental Information and Training Centers in the Mexican border states this year. Centers will include hard-copy publications and public workstations that will be connected to the Internet and both SEMARNAP and EPA on-line environmental services.

- Maintain and expand the U.S. Border XXI repositories, and establish public workstations connected to the Internet and both EPA and SEMARNAP on-line services in the EPA U.S.-Mexico Border Liaison Offices (located in San Diego, California, and El Paso, Texas). BECC also has a repository for Border XXI hard-copy publications, as well as public workstations connected to the Internet.

- Compile, distribute and maintain an electronic binational environmental information directory which includes existing resources such as EPA's Project Compendium, EPA's environmental indicators resource list, information on subject experts, information on project funding, and general information generated by the Border XXI Workgroups. The Workgroup will produce periodic updates of the Border XXI Program for general distribution.

- Initiate use of the *us-mexborder* listserver as a focal point for discussion of the Border XXI Program.

➤ Establish a unified GIS system for the U.S.-Mexico border area:

- Establish a joint, common GIS database for the U.S.-Mexico border. GIS acquisition, analysis and reporting is a key component of this initiative. DOI's USGS in the U.S., and SEMARNAP/INEGI on the Mexican side will coordinate in an aerial photographic survey of the border zone to support this effort (please see Appendix 12). The Workgroup will keep the other Border XXI Workgroups informed of the progress on this project.

- DOI/USGS, DOS, SEMARNAP, and INEGI, with the support of EPA, IBWC, CEC, state governments, and nongovernmental partners will continue to pursue the multiscale baseline mapping to address the needs of Border XXI Workgroups. This will be based on appropriate aerial photography and satellite imagery.

- The Workgroup's Geospatial Data/GIS subgroup will address compatibility standards for Border XXI geospatial data themes.

➤ Promote environmental education opportunities in border communities:

- Work with the Border XXI Workgroups and with local communities to identify each border community's most important environmental education, training and capacity needs, and establish regional bases of information that respond to those needs.

- Organize a series of conferences on formal environmental education in the border region to inventory existing curriculum and environmental education resources, and identify additional needs.

➤ Assist the Strategic Planning and Evaluation Team in the development of environmental indicators for the border region to systematically measure the extent to which environmental policy addresses the most urgent environmental issues.

III.8 Pollution Prevention

Issues and Problems

In recent years, the border area has undergone rapid urban and industrial growth which, in turn, has negatively affected the environment. Investing resources to reduce or prevent pollution from being generated in the first place is often a much more cost-effective means of improving the environment and avoiding environmental health problems than spending resources on regulation, treatment, storage, and disposal.

The mission of the Pollution Prevention Workgroup is to demonstrate and promote the benefits of pollution prevention to protect the environment and promote sustainable development in border communities. To achieve its mission, one of the Workgroup's principal objectives is to coordinate efforts to define and implement pollution prevention projects in the border area. To this end, public

input is crucial as a means of learning where to focus pollution prevention efforts and obtain new ideas on how to effectively communicate the benefits of pollution prevention practices. These practices must be viewed in accordance with the regulatory, socio-economic, and cultural aspects that are unique to each country.

Because pollution prevention is a tool to be implemented in all the Border XXI Workgroups, close coordination and cooperation is needed between the workgroups to ensure that they complement one another's agenda. In addition, the Pollution Prevention Workgroup will support the efforts of the other workgroups to direct attention to useful pollution prevention practices.

TABLE 3.14
POLLUTION PREVENTION
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Bilingual pollution prevention manuals for selected industrial sectors: - Woodfinishing Industry - Metal Finishing Industry - Electronics Industry - Textile and Apparel Industry	1994 completed 1995 completed expected 1996 expected 1997	EPA, TNRCC, ADEQ, CDTSC, NMED, INE	Completion of bilingual pollution prevention manuals for the wood finishing and metal finishing industries. Bilingual manuals for the electronics industry and textile and apparel industry are forthcoming.
Bilingual pollution prevention technical conferences: - Woodfinishing - Metal Finishing Industry - Electronics Industry - Textile and Apparel Industry	1995 1993-1994 1996 1997	EPA, TNRCC, ADEQ, CDTSC, NMED, INE	Previously held conferences on pollution prevention in the wood finishing industry and metal finishing industry. Conferences also to be held on electronics industry and textile and apparel industry upon completion of bilingual manuals.

TABLE 3.14
POLLUTION PREVENTION
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Bilingual video on pollution prevention as a tool for enforcement (Cooperative Enforcement Workgroup)	Summer 1996	EPA, PROFEPA, ITESM	Video to assist maquiladoras' compliance through voluntary auditing. The video is currently being reviewed and translated into the final draft by PROFEPA.
Pollution prevention curriculum conference for students and graduates in engineering	1995-Ongoing	EPA, TNRCC, ITESM, University of Texas-Pan American, Monterrey Institute of Technology, University of Nuevo León	Conference was held November 1995 on development of a pollution prevention curriculum for students and graduates in engineering. Guideline chapters are under development and should be completed by October 1996. Another conference is being organized to further the curriculum on pollution prevention, disseminate available information materials, and exchange creative problem-solving approaches.
Develop sector manuals to assist Mexican Pollutant Release and Transfer Register (PRTR) covering the following issues: Enforcement and Compliance Assurance, Release Estimation Techniques, and Pollution Prevention	1996-Ongoing	EPA, INE, NJDEP	Planning stages of developing more standardized TRI (Toxics Release Inventory) manuals to aid in enforcement compliance issues, release estimation, techniques, and pollution prevention. Scope of the services are still being developed.
Technology transfer and capacity building on pollution prevention with INE	1996-Ongoing	EPA, INE, TNRCC	Working together to train personnel in voluntary auditing compliance through technology transfer and capacity building. Conferences and meetings have been held in order to share information with INE, PROFEPA, and the Maquiladora Association.

Objectives for the Next 5 Years

Both countries will continue with their pollution prevention activities directed at industry, state and local governments, and private citizens to promote pollution prevention as a cost-effective means of reducing levels of contamination, improving the quality of life for border residents, and promoting economically and environmentally sustainable development. In order to implement this strategy, both governments have agreed to focus on the following pollution prevention objectives over the next five years:

- Increase technical exchange at all levels of government to enhance assistance and outreach to industry:
  - Develop additional bilingual pollution prevention manuals for priority industrial sectors.
  - Expand pollution prevention technical assistance to small business operations.
  - Expand pollution prevention assistance to maquiladoras.
- Increase technical assistance and outreach to federal, state, and municipal authorities, and the general public:
  - Develop an initiative on recycling and solid waste handling activities.
  - Deliver workshops on recycling and municipal waste treatment.
  - Create, in association with the Cooperative Enforcement Workgroup, a pollution prevention component in the audit program that can be used in both countries.
  - SEMARNAP's National Institute of Ecology will develop a pollution prevention office.
  - Initiate a Pollution Release and Transfer Registry (PRTR) in Mexico and develop common information dissemination procedures and compatibility between the Mexican PRTR and the EPA Toxics Release Inventory (TRI).
  - Provide technical support to Mexican state governmental agencies in recycling and pollution prevention.
  - Assist the Agency for International Development (AID) in the provision of technical information to aid facility personnel to identify and implement pollution prevention and energy efficiency improvement opportunities within their respective plants, and, in turn, to disseminate this information to other facilities and industries within Mexico.
- Increase cooperation and coordination with other Border XXI Workgroups and other entities involved in promoting pollution prevention.

TABLE 3.15
COOPERATIVE ENFORCEMENT AND COMPLIANCE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Building networks of interagency cooperation	Ongoing	PROFEPA, EPA, DOJ, TNRCC, NMED, ADEQ, Cal-DTSC, local and county authorities, DOT, SCT, U.S. and Mexican Customs, CNA, CICOPLAFEST, regional environmental enforcement network associations	Regional Enforcement Subgroups established for Texas-Chihuahua and California-Baja California in March 1996, to enhance local interagency cooperation EPA provides to the state environmental agencies support for national and binational cooperation along the entire border.
Cooperative targeting and detection of violations	Ongoing	EPA, PROFEPA, state environmental agencies, DOJ	HAZTRAKS is being successfully used as a tool to detect violations. EPA is refining a model using industry data to predict maquiladora waste generation rates for enforcement targeting.
Case-specific cooperation	Ongoing, as cases occur	EPA, PROFEPA, state environmental agencies, DOJ, United States Attorneys	Cooperation in case investigations has supported several enforcement actions; e.g., U.S. prosecution of illegal hazardous waste exports (A&W Smelter/Mina La Union; Sbicca); California state enforcement action leveraging funds to clean up a contaminated site in Mexico (Alco-Pacifico). EPA and Cal-DTSC supported PROFEPA in the investigation of a soil amendment (Sea Soil) which PROFEPA concluded resulted in contamination when used at several ranches in Baja California.
Enforcement results information sharing	Ongoing	EPA, PROFEPA, state environmental agencies, DOJ	Annual exchanges of enforcement statistics have been taking place.

TABLE 3.15
COOPERATIVE ENFORCEMENT AND COMPLIANCE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Transboundary hazardous waste compliance training for Customs and environmental inspectors	Systematic repetition of courses at major border crossings since November 1994	EPA, PROFEPA, U.S. and Mexican Customs, DOT, SCT, Cal-DTSC, San Diego County Health Dept., ADEQ, NMED, TNRCC, regional environmental enforcement network associations, Cooperative Enforcement and Compliance and Hazardous and Solid Waste Workgroups	Over 230 U.S. and Mexican customs and environmental inspectors trained at 13 border crossings, resulting in improved field cooperation and detection of illegal hazardous waste shipments.
Training to detect CFC smuggling	Ongoing	EPA, PROFEPA, CICOPLAFEST, U.S. and Mexican Customs, state environmental agencies, DOT, SCT, DOJ	Training first piloted at El Paso Customs, May 1996. As of August, 1996, there have been 20 training sessions at major customs facilities for 240 U.S. and Mexican officals.
Multimedia inspector training	Periodic since 1992	EPA, PROFEPA, CNA and municipal water discharge inspection authorities	Over 600 Mexican inspectors trained (450 in border states). Course enhanced to include pollution prevention and water discharge information. Train-the-trainer efforts ongoing.
Principles of Environmental Enforcement Workshop	May 1995	EPA, PROFEPA, INE, CNA, local environmental authorities (D.F.)	First workshop held in Mexico City, May 1995. EPA and PROFEPA are exploring possible workshops in the northern Mexican border and in Central and South America.

TABLE 3.15
COOPERATIVE ENFORCEMENT AND COMPLIANCE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Field investigations, sampling, and laboratory analysis training	Under Development	EPA, PROFEPA, INE, Cal-DTSC, San Diego County Health Department, TNRCC, ADEQ, NMED, regional environmental enforcement network associations, DOJ, U.S. Attorneys. Cooperative project of Cooperative Enforcement and Compliance and Hazardous and Solid Waste Workgroups	PROFEPA provides training and support for inspectors in taking samples and laboratory analysis in the northern Mexican border area. PROFEPA attended a course in this area provided by the Southern Environmental Enforcement Network in Little Rock, Arkansas in February 1995. EPA, PROFEPA, and U.S. States are working on developing cooperative training in this area.
Consultation on environmental laws and enforcement policies San Diego, California	July, 1996	EPA, PROFEPA, Environmental Law Institute, state environmental agencies, Attorney General, DOJ, and U.S. Customs	Consultation involved case studies exploring legal, environmental, and technical practicalities of enforcement in U.S. and Mexico.
Consultation on enforcement and compliance data systems	Completed June, 1995	EPA, PROFEPA,	EPA developed report on enforcement data systems and provided to PROFEPA in June 1995 for their analysis and use in improving their own system.
Consultation on calculation of economic sanctions for infractions of the law	Under Development	EPA, PROFEPA	EPA and PROFEPA exchanged information used to determine the amount of sanctions for infractions of the law. EPA and PROFEPA will initiate consultations regarding methodologies of both countries in calculating economic sanctions in enforcement cases, taking into account the benefit, to the violator, of noncompliance.

TABLE 3.15
COOPERATIVE ENFORCEMENT AND COMPLIANCE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Consultation and training in criminal environmental enforcement	Ongoing	EPA, PROFEPA, DOJ, TNRCC, Southern Environmental Enforcement Network	EPA and PROFEPA have conducted technical consultations to assist PROFEPA in developing a program to support prosecution of environmental crimes. PROFEPA attended Advanced Environmental Crimes Training Program at the Federal Law Enforcement Training Center, November 1995. At TNRCC's invitation PROFEPA participated in an environmental crimes training course in Austin, May 1996.
Protocol for cooperation in environmental enforcement investigations	Under Development	EPA, DOJ, DOS, state environmental agencies, PROFEPA	EPA and PROFEPA have begun to identify issues to be addressed and a process for negotiating.
Promotion of voluntary compliance through environmental auditing	Ongoing	EPA, PROFEPA, Environment Canada, North American Commission for Environmental Cooperation, Cal-DTSC, TNRCC	EPA sent letters to 31 U.S. parent corporations of maquiladoras encouraging participation in PROFEPA's voluntary environmental audit program in May 1995, and sent a second round of letters to 200 additional U.S. parent corporations in July 1996. At PROFEPA's request, EPA also sent letters to 70 parent corporations of maquiladoras located in Chihuahua in March 1996, encouraging voluntary compliance with Mexico's regulations governing transboundary shipments of hazardous waste. PROFEPA, EPA, Environment Canada, and the North American Commission on Environmental Cooperation hosted conferences in Ciudad Juarez (9/95) and Tijuana (12/95) for over 300 industry participants on voluntary compliance and environmental auditing in North America.

TABLE 3.15
COOPERATIVE ENFORCEMENT AND COMPLIANCE
PAST AND ONGOING PROJECTS - BORDERWIDE

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Governmental consultations on voluntary compliance and environmental auditing	Ongoing	EPA, PROFEPA, Environment Canada, North American Commission on Environmental Cooperation, state environmental agencies	Intergovernmental consultations initiated in 1995 regarding the governments' respective programs and policies to promote voluntary compliance through environmental auditing.
Video: *Environmental Auditing and Pollution Prevention: Strategies for Voluntary Compliance in the Maquiladora Industry*	Ongoing	EPA, PROFEPA, Cal-DTSC, TNRCC	Initial version produced 9/95. Final revisions and distribution of video in 1997 subject to allocation of adequate resources.

Objectives for the Next 5 Years

The following are the broad objectives for enforcement and compliance cooperation over the next five years, taking into account the resources that may be available to the parties.

- Continue efforts to achieve compliance with environmental requirements in the border area through:
  - Planning inspections on both sides of the border, with institutionalized national training programs, quality inspections, and prioritizing inspections for maximum effectiveness.
  - Taking legal actions when violations are detected, and conducting follow-up to ensure future compliance.
  - Effective deterrence through sanctions which take into account the economic benefit of noncompliance and discourage contempt of the laws; and through effective public communication of enforcement activities and results in accordance with the legal framework of each party.
- Establish and enhance networks of cooperation among the various state, local, and federal agencies on both sides of the border involved in environmental enforcement and compliance:

- Promote the establishment of subgroups for each geographic region, to enhance multiagency binational cooperation and identify priorities for regional enforcement cooperation.

- Promote the participation of the representatives of the different competent agencies, through the coordinators of the border subgroups, to explore solutions to specific environmental problems.

- In a manner which respects the sovereignty of each party, the Cooperative Enforcement Workgroup will analyze and, as appropriate, approve for implementation the proposals of the subgroups.

➤ Encourage voluntary compliance by industry, through strategies such as environmental auditing and the use of clean technologies and less-contaminating raw materials, as a complement to a strong program of law enforcement.

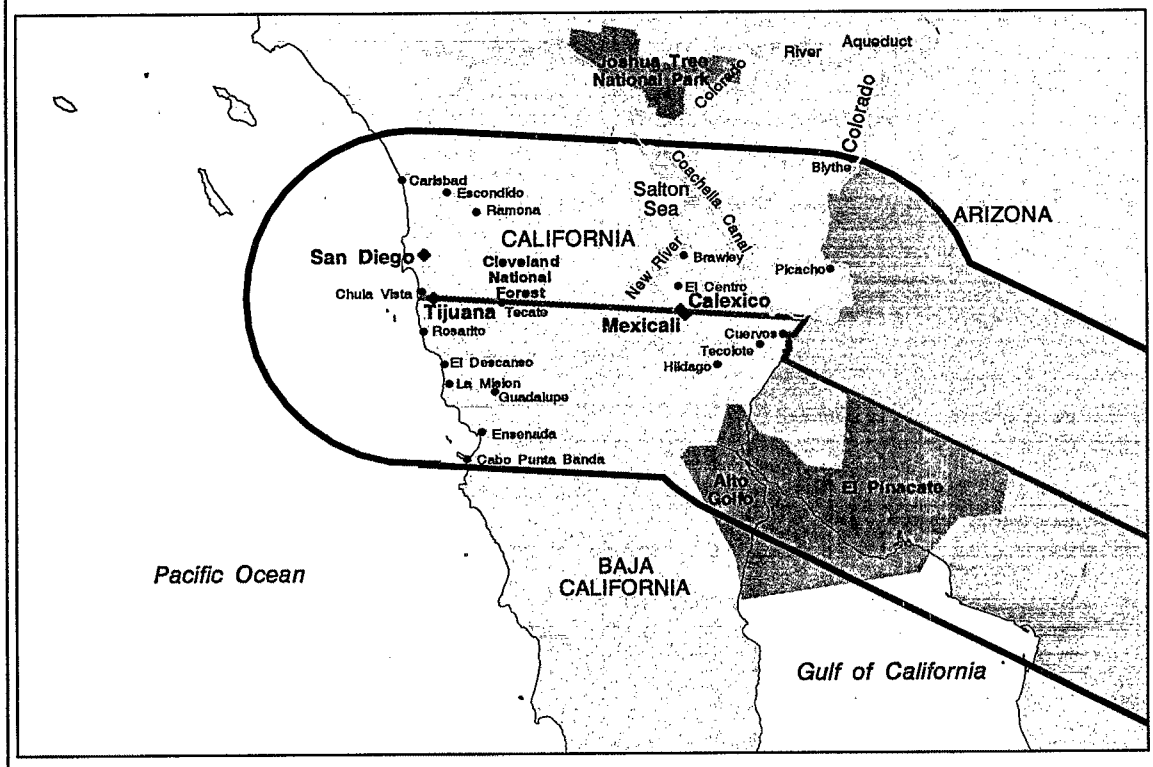
➤ Develop similar systems of reporting regarding compliance and enforcement, in accordance with the legal framework of each party.

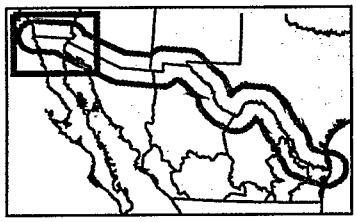
➤ Promote the evolution of mechanisms to enhance the evaluation of compliance with environmental law.

➤ Promote pollution prevention as a mechanism for solving compliance problems.

➤ Continue to promote public participation within the legal framework of each party.

California-Baja California Region





City
Sister City
State Boundary
U.S./Mexico Border
100km Buffer
Water Body
Protected Area

CDSI
Computer Data Systems, Inc.
Map created by CDSI
September 25, 1996

N

100 0 Miles

Sources: Digital Chart of the World, TNRIS, National Parks Service

EPA Region 6
GIS Team
Dallas, Texas

CHAPTER IV

CALIFORNIA-BAJA CALIFORNIA

In order to promote a regional approach to environmental problem solving, this chapter focuses on environmental issues and problems, past and ongoing projects, and objectives that are specific to the California-Baja California area of the border region. The borderwide objectives and ongoing activities described in Chapter III also pertain to the California-Baja California border region.

Brief Overview

The California-Baja California region stretches approximately 138 miles (222 km) along the international boundary from the Pacific Ocean to the Colorado River and includes four areas of concentrated population. The primary sister city pairs along this western stretch of the border are San Diego-Tijuana and Calexico-Mexicali. Ensenada, south of Tijuana, and Tecate, between Tijuana and Mexicali, are also located in this part of the border region. This area is an important center of agricultural production, particularly in Imperial County and the Mexicali Valley.

TABLE 4.1
POPULATION

Population Center	1980 Population	1990 Population	1995 Population
San Diego (County), California	1,862,000	2,498,000	2,721,000
Tijuana, Baja California	428,000	747,000	989,000
Ensenada, Baja California	175,000	261,000	314,000
Tecate, Baja California	31,000	52,000	62,000
Calexico, California	14,400	19,000	25,000
Mexicali, Baja California	511,000	602,000	696,000
Total	**3,021,400**	**4,179,000**	**4,807,000**

- 1980 and 1990 California figures are from the U.S. Census.
- 1995 California figures are estimates from the California Department of Finance population estimates from California Cities and Counties Report 96E-1, May 1996, projections for January 1, 1996.
- 1980 and 1990 Baja California figures are from the X and XI INEGI census.
- The data for 1995 in Baja California comes from the 1995 INEGI Count of Population and Housing.

In addition to industrial and commercial population centers, this region includes many protected areas that are rich in biodiversity and natural beauty: the Tijuana Estuary (which includes the Tijuana

Slough Wildlife Refuge and Estuarine Resource Reserve), the Salton Sea, Rio Hardy Wetlands, the Cleveland National Forest, Otay Mountain/Kuchama Cooperative Management Area (BLM), the Anza-Borrego Desert State Park and Tijuana River Valley Regional Park in the U.S.; the Constitución de 1857 National Park, Sierra de Hansen, Mesa del Pinal, and Sierra de San Pedro Martir National Forest Reserve, and the Alto Golfo de California-Delta del Rio Colorado Biosphere Reserve in Mexico.

The area is characterized by coastal scrub and chaparral ecosystems that occupy the coastal and southern inland ranges of California and continue into Baja California. At higher elevations and near the ocean, chaparral is interspersed with coniferous forests and riparian vegetation along valleys and intermittent streams. Flora and fauna are quite diverse, and many of these interspersed areas provide an extraordinarily valuable habitat for neotropical birds as nesting and migration stopovers. These ecosystems support numerous U.S. and Mexican officially listed endangered species. The coastal waters of the Pacific Ocean support marine life and habitat for several species along the West Coast.

An important natural feature of the region is the Colorado River system. Significant aquatic and wetland resources in the region include the Salton Sea, Alamo River, Rio Hardy, and Laguna Salada. The delta of the Colorado River in Mexico was once a great desert estuary supporting riparian, freshwater, brackish and intertidal wetlands in this most arid portion of the Sonoran Desert. Development and water usage in the Colorado River Basin have impacted ecological resources. The Alto Golfo de California-Delta del Rio Colorado Biosphere Reserve is an important area for the protection of rare and endangered marine species, such as the Totoaba fish and Vaquita dolphin, some of which are dependent upon the Colorado River Estuary. It is also an important breeding ground for commercial species such as shrimp.

Environmental Issues and Problems

Natural Resources

Habitat alterations are the principal concern affecting biodiversity in this region. In Baja California, chemical contamination also poses biodiversity concerns. The illegal extraction of wild flora species, such as cacti, and the introduction of exotic species that alter natural habitat are ongoing problems in both countries. Illegal hunting and trafficking of wildlife species are also of concern.

The ecosystems in northern Baja California are very similar to those in Southern California. Highly fire dependent ecosystems in Southern California and Baja California can no longer be allowed to burn naturally because they are too close to urban areas and because of the potential for extremely dangerous wildfires. Additionally, because of the increased population along the border, the demand for wood and wood products continues to increase while the land availability for wood production is decreasing.

Increased risk of forest pests and disease introduced along the border adversely affects native forest species and results in high mortality of nursery and forest seedlings.

Because so much industry is concentrated along the border area, there is also a concern regarding the effects of acid rain deposition on nearby ecosystems and its potentially significant negative impacts.

Increased sedimentation in the Tijuana River resulting from urbanization and unregulated road development has affected aquatic and land resources in the Tijuana Estuary.

Residual flows from the Colorado River into Mexico, along with irrigation return flows and brine waters, have greatly affected the ecology of the Upper Gulf of California and the Cienega de Santa Clara.

Water

Members of the California-Baja California community and both governments view resolution of water pollution problems and their effects on human and natural populations as a high priority. Consistently, beaches in the San Diego area must be closed because of high levels of fecal coliform due to insufficiently treated sewage discharged into the ocean. Local authorities and the public are also concerned with the lack of control of industrial waste in sewage discharges. Impacts from sewage flows, excessive dry-weather freshwater inflows, and additional contaminant runoff from agriculture and urban development also threaten the ecological integrity of the Tijuana River watershed and estuary. Erosion and slope instability in urban areas of Tijuana and U.S. lands in the Spooner's Mesa area have aggravated flooding, both in the main river channel and its tributaries, and poses a growing hazard during periods of moderate to heavy rainfall. In addition, the tidal area in the Tijuana Estuary has been reduced by 80 percent and the wetlands by about 60 percent. Because adequate tidal flushing is considered key to the health of the entire system, erosion control, sediment management and excavations directed at enhancing the Tijuana Estuary's tidal prism (flushing capacity) are a high priority. Although interim measures by the U.S. and Mexican governments have minimized negative impacts of raw and partially treated sewage on the ocean, beaches, and estuary on a short-term basis, the problem requires a long-term, basin-wide solution.

Due to the arid climate and the burgeoning population of San Diego, Tijuana, Tecate and Ensenada, there is a critical need for a local, integrated water management plan. Some studies predict that by the year 2000 there will be serious drinking water shortages in the area.

The Colorado River begins in the U.S. and flows for over 1200 miles (1920 km) to the international boundary where it enters Mexico east of Mexicali and continues for nearly 100 miles (160 km) before ending in the Gulf of California. Colorado River water is used as a source of drinking water and irrigation for communities on both sides of the border in the California-Baja California region. Thus, the quantity and the quality of the Colorado River water are very important to the border communities in this region. In particular, agricultural activities in the lower part of the Mexicali Valley basin have been seriously affected by salinity and sediment generated in the upper part of the basin.

In accordance with the agreements between the two countries, the IBWC is charged with overseeing activities including water quantity and quality in the Colorado River.

The New River, often cited as one of the most polluted rivers in the U.S., flows through the Mexicali Valley into California's Imperial Valley and discharges into the Salton Sea. Water quality of the river is very poor due to large amounts of raw and partially treated municipal and industrial wastewater from Mexicali and agricultural drainage from the U.S. and Mexico. Mexicali is grappling with an inadequate wastewater collection and treatment system. The existing treatment plants are operating

at a capacity far greater than that for which they were designed. Consequently, discharges to the New River are not sufficiently treated. Additional volumes of uncollected and untreated municipal and industrial wastewater flow directly into the New River or its tributaries. The high concentrations of bacteria and viruses in the New River pose serious public health risks to the people who live along the river.

The Alamo River, like the New River, originates in Mexico and flows to the Salton Sea in the U.S. The Alamo River is contaminated with pesticides and fertilizers from agricultural irrigation and drainage from the U.S.

Through analysis of the region's water infrastructure needs, CNA found that for the four most populous cities in the Baja California region (Tijuana, Mexicali, Ensenada and Tecate), 92 percent of the population receives quality drinking water, 65 percent of the residences are connected to a sewer system, and 44 percent of the total wastewater is treated (although in many cases the operation and maintenance of treatment systems are deficient). Improvement and expansion of the sewer systems in these cities are of critical importance in the short-term. In the medium- and long-term, responsible authorities should focus attention on drinking water supply options. At this time, CNA has estimated resource requirements needed to meet the region's present infrastructure deficiencies as shown in Table 4.2.

TABLE 4.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $US)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Drinking water	10.0	8.0	2.0	20.0
Sewer systems	9.0	13.0	17.0	39.0
Treatment	9.0	15.0	16.0	40.0
Consolidation	1.0	4.0	1.0	6.0
Increased efficiency	3.0	4.0	4.0	11.0
Studies and projects	1.8	0.1	0.2	2.1
Total	33.8	44.1	40.2	118.1

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

Environmental Health

Along the California-Baja California border, there is a need for improved binational capacity for environmental health and exposure surveillance, intervention, prevention, evaluation, research, training, and outreach by the state and local agencies. These efforts should involve key stakeholders such as community residents, health-care providers, academic institutions, trade groups, unions and other nongovernmental groups.

Growers in the U.S. and Mexico use significant quantities of pesticides in the production of their crops, particularly for fruits and vegetables. Training and outreach on the proper handling of pesticides are crucial, given the potential for health and environmental problems due to worker exposure and air and water contamination.

Air

Air quality is of particular concern in the region's urban areas. Increased transboundary traffic has resulted in a dramatic increase in air pollution from mobile sources, particularly due to unpaved roads and congestion at border crossings.

In terms of regional air quality, the San Diego area is designated a nonattainment area for U.S. ambient air quality standards for carbon monoxide (CO) and ozone (O_3). Imperial County is designated a nonattainment area for U.S. ambient air quality standards for PM-10, O_3, and CO.

Currently in Mexico, there is no guidance by which to determine "nonattainment" with Mexican air quality standards. There is insufficient air quality monitoring data to determine if Mexican cities meet the Mexican air quality standards. Aside from these limitations,Tijuana and Mexicali potentially do not meet Mexican air quality standards for particulate, carbon monoxide, and ozone. This is based on existing monitoring results as well as a knowledge of emissions sources and their potential emissions.

Hazardous and Solid Waste

Residents of California-Baja California border communities expressed significant concern about the types, quantities and destinations of hazardous materials and wastes. Community and government concerns stem from the high number of crossings of the California-Baja California border and projections that commercial transportation across the international boundary will likely increase with the phase-in of NAFTA.

Citizens want information about the presence of hazardous materials and wastes in their community. In addition, this information has important implications for emergency response planning and contingency preparedness, as well as for authorities and regulators trying to ensure compliance with state and federal requirements governing the transport, handling, treatment, storage, recycling, and disposal of hazardous wastes in the region. To date, binational efforts aimed at gathering this information have focused on tracking the transboundary movement of hazardous waste. However, many citizens and local authorities in the region expressed that while ongoing tracking of hazardous waste crossing the border remains very important, knowing the types and quantities of raw materials crossing the border is also critical, especially for purposes of emergency response planning.

Insufficient waste management infrastructure has the potential for encouraging improper and potentially unsafe disposal of waste as well as illegal dumping; practices that have a negative impact on the urban and natural environment and pose threats to public health. While industries in Baja California generate hazardous wastes, currently no hazardous waste management facilities exist in the state. SEMARNAP has identified the following waste management infrastructure concerns in Baja California: a lack of sanitary landfills for solid waste; a lack of treatment, neutralization, or incineration systems for hazardous and toxic wastes; a lack of motivation and training to promote

hazardous waste minimization; and lack of an official laboratory equipped to analyze hazardous wastes.

Contingency Planning and Emergency Response

In all the regions' major urban areas on both sides of the border, emergency response capabilities are inadequate, particularly with regard to training and equipment. The volume of materials, goods, and waste moving through California-Baja California communities underscores the need for adequate emergency response capabilities, including properly trained and equipped personnel, to respond to accidents which may pose a threat to public health and the environment.

Environmental Information Resources

Through the Border XXI public outreach meetings, citizens in the California-Baja California sister cities expressed a need for increased education and awareness regarding general, regional, and local environmental issues including air, water, waste, natural resources, health impacts from environmental degradation, and the relationship between the environment and quality of life. Many members of the California-Baja California border community consider the lack of information and general absence of environmental awareness on local and regional problems the main impediments to raising environmental quality and increasing public involvement in solving and preventing environmental problems. Similarly, throughout the region there was a call for pollution prevention information which is tailored and delivered to appropriate domestic, agricultural and industrial audiences.

Cooperative Enforcement and Compliance

Because of the growing concentration of population and industrial activity, compliance with environmental requirements is essential for health and welfare in the area. Local, state and federal agencies involved in enforcing environmental laws and promoting compliance can improve their effectiveness through cooperation.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NATURAL RESOURCES			
Rehabilitation of sand dunes habitat in the Tijuana Slough NWR, California	Ongoing	FWS	Habitat restoration of the sand dunes located at Tijuana Slough NWR is an annual project.
Habitat protection of endangered species in the Tijuana Slough NWR, California Groundwater Study	Ongoing	FWS	Various maintenance management projects that support habitat protection of endangered species.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
San Diego Formation Groundwater Study	1995-1997	USGS, Tijuana Valley Water District	Drilling multidepth wells to collect geohydraulic data.
Survey of nesting ospreys	1996	BRD, SEMARNAP	Survey nesting ospreys along California-Baja California.
Management program for the Alto Golfo de California and Delta del Rio Colorado Biosphere Reserve	1994	INE, CICTUS, CES, CIDESON, CEDO, COLEF, UABC, INP, CICESE, PRONATURA, A.C.	The management program which guides actitivites in the Reserve was finalized. The program was agreed to by local communities, local authorities, and NGOs.
Status of the beaver in the Mexicali Valley	1995	INE, CICESE	The study provided understanding of sites with beaver activity in the Mexicali Valley and the Colorado River Delta.
Terrestrial mammals of Baja California	Ongoing	IB-UNAM, INE	To gather information on the state of knowledge of mammals in B.C. and identify the areas of high species concentration.
Sierra Hansen National Forest Reserve, Mesa de Pinal, and San Pedro Martir	1994	SFFS-SARH, Promotora Agropec. Univ. S.A.	Flora and fauna study of the National Forest Reserve.
Sierra de Hansen, Mesa de Pinal, and Sierra de San Pedro Martir National Forest Reserve	Ongoing	USFS-RMRS, NM State Forestry, and NPS.	Management plan and methodology for implementation that encourages local community involvement.
Constitución 1857 National Park	1993	SFFS-SARH, Advisory Group for Ecology and Environment	Study of the natural resources in the National Park.
Evaluation of the impacts of air pollution on the forests of the west and east of the U.S. and the central part of Mexico	Ongoing	INIFAP, USFS - PSU Station,	Improved the genetic quality of the species located in Southern California as a result of monitoring the damage of ozone to native tree species and climatic variations in forests.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Multiple species habitat planning in southwest San Diego County	Ongoing	FWS, local government	Natural resource mapping, assessment, and preliminary draft plans for species and habitat conservation.
Draft Cooperation Agreement for flat-tailed horned lizard	Ongoing	FWS, BLM, DOD, BOR, CA Fish and Game, AGFD, CA Parks	Preliminary assessment of habitats and identification of lizard management approaches.
Volunteer exchange program	1993 - Ongoing	USFS-Cleveland, San Bernardino & Sequoia NF, INIFAP N.-Region, SEMARNAP-Chihuahua and Sonora	Natural resource information disseminated through exchange of personnel.
WATER			
Tijuana wastewater	1990-1996	EPA, IBWC, USACE, SWRCB, RWQCB 9, San Diego, IBWC, CNA	Construction of land outfall has been completed. Construction of advanced primary IWTP and ocean outfall has been initiated. Design of canyon collectors and secondary treatment facilities (activated sludge) has been completed. The government of Baja California and CNA will contribute to the construction of the binational plant with an investment equal to the cost of constructing the treatment plant in Tijuana, Baja, California ($16.8M US).
Mexicali wastewater	1995-1999	EPA, IBWC, SWRCB, RWQCB 7, IID, Imperial County, CNA, IBWC, SAHOPE, CESPM, COSAE, Mexicali	USIBWC has procured a contractor to develop a binational facility plan. A binational technical team (subgroup) has been formed. Mexico has initiated construction on several projects to rehabilitate the existing collection and conveyance system. Several discharges of raw sewage to the New River have been eliminated or reduced.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
New River toxics model	1995-1996	EPA, UCD	UCD has collected samples along the length of the New River and is developing a model to predict behavior of toxic organic pollutants in river sediments and water.
Lower Colorado River-New River data synthesis	Ongoing	EPA, UCD	EPA has issued a grant to UCD to prepare bilingual reports summarizing and synthesizing existing water quality data for the Lower Colorado and New Rivers.
Lower Colorado River-New River toxics survey	1994-1996	EPA, USGS, IBWC, UCD, DFG, Arizona, CNA, IBWC	Two rounds of water, sediment and fish tissue samples have been collected on the Lower Colorado and New Rivers.
Tecate Wastewater Treatment Plant	1993-1994	CNA, SAHOPE, COSAE, CESPT	Construction was completed and the plant is in operation with a capacity of 200 lps.
Drinking water and sewer system in Tecate	1996-1997	CNA, SAHOPE, COSAE, CESPT	Rehabilitation and expansion of the drinking water system and sewer system.
Ensenada Wastewater Treatment Plant	1996-1998	CNA, SAHOPE, COSAE, CESPM	BECC has certified the wastewater treatment plant project. The state authorities are reviewing the project which may be modified and resubmitted to the BECC.
Colorado River-Tijuana Aqueduct	1996-1997	CNA, SAHOPE	Additional pumps will be installed between Pumping Plants 4 and 5, and a new internal coating will be applied to the water transport line.
Colorado River-New River water quality	1995-1997	USGS, EPA, IBWC, CNA	One year of samples collected using new field protocols. Training provided. Analysis still in progress.
Colorado River NASQAN	Ongoing	USGS	Long-term datasets: water quality, sediments and discharge.
ENVIRONMENTAL HEALTH			
New River, Imperial County	1995-1996	CDHS, ATSDR	Ongoing development: environmental health education for community and health-care providers.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Training on occupational medicine	1996	CDHS, Local Association of Maquila Doctors, Baja California Health Ministry	Began development of teaching modules and establishing collaboration with key labor, management, and medical groups.
Environmental health GIS survey of environmental and health outcome information	1995-2000	CDHS, NIEHS	Evaluating existing databases and collaborating with border states that are developing concurrent GIS survey projects.
AIR			
Tijuana-San Diego air programs	Ongoing	EPA, INE, Baja California, CARB, San Diego, Tijuana	Operate 4-station ambient monitoring network in Tijuana measuring for CO, NOx, SO_2, PM-10, Lead, O_3, and meteorological parameters. Two additional sites are measuring PM-10 and air toxics. Twelve monitoring sites are currently operating in San Diego. Emissions inventory completed in San Diego and being developed in Tijuana. A Mexican inventory of 173 industrial sources now exists.
Imperial County-Mexicali air programs	Ongoing	EPA, INE, Baja California, CARB, Imperial County, Mexicali, Calexico	Completed and released a PM-10 source apportionment study. Complete development of 4-station ambient monitoring network in Mexicali measuring for CO, NO_x, SO_2, PM-10, lead, O_3, and meteorological parameters. Two additional sites will measure PM-10 and one site will measure air toxics. Eight monitoring sites are currently operating in Imperial County. Develop emissions inventory.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
HAZARDOUS and SOLID WASTE COOPERATIVE ENFORCEMENT and COMPLIANCE **(Please see Appendix 10 for additional solid and hazardous waste projects of U.S. state and local agencies)**			
Preliminary environmental assessment on solid wastes (Tijuana, Ensenada)	1993	B.M., SEDESOL	Identify needs for solid waste infrastructure for protection of the environment.
Evaluation and integrated study of the general situation for solid wastes; study of the environmental impact of a sanitary landfill (Mexicali)	1993-1994	B.M., SEDESOL, Municipal Government	Development of an implementation plan and identification of equipment needs for pilot projects in the solid waste sector.
Improve hazardous waste field sampling and lab analysis capability (including creation of mobile lab units)	1995-1997	EPA, SEMARNAP, SINALP, Cal-DTSC, San Diego County	Improved ability to detect violations of hazardous waste management and import/export regulations.
Utilize regional geographic subgroups to implement the Hazardous and Solid Waste and Cooperative Enforcement Workgroup objectives	Ongoing	EPA, SEMARNAP CAL-DTSC Cal-EPA, U.S. and Mexican Customs, San Diego & Imperial Counties	Development and delivery of geographic specific projects.
Conduct hazardous waste management training	1996-1997	EPA, SEMARNAP	Increase capability of agency and industry managers and inspectors.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Conduct San Diego-Tijuana solid waste stream analysis and develop a binational recycling market development zone (in cooperation with Pollution Prevention Workgroup)	1996-1997	EPA, San Diego, Tijuana, Cal-EPA/IWMB, SD State University, UABC	Increase recycling and waste prevention within the commercial and industrial sector along the border; create a binational recycling market development zone.
Facilitate adoption and implementation of a remediation plan for the Alco Pacifico site	Ongoing	SEMARNAP, EPA, Los Angeles County	Adoption of a plan for stabilization or remediation of the Alco Pacifico site.
Train Customs inspectors in detection of illegal transboundary hazardous waste shipments	1995-1996	EPA, SEMARNAP, San Diego County U.S. and Mexican Customs, Cal-DTSC	Increased capability by U.S. and Mexican Customs to detect and handle illegal hazardous waste shipments.
Participate with Enforcement Workgroup in environmental auditing workshop	1995	EPA, SEMARNAP, CEC, Cal-DTSC	Contribute information on Mexican environmental auditing program; begin a trinational dialogue on ISO 14000.
Binational training on design, operation and closure of municipal solid waste landfills	1994-1995	EPA, SEMARNAP	Increased capability for management of solid waste landfills.
Train import/export industry representatives on regulations and requirements pertinent to shipments of hazardous waste to and from California	1996	Cal-DTSC, EPA, SEMARNAP	Increase industry awareness of and compliance with pertinent hazardous waste and export/import requirements.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
U.S.-Mexico border projects	Ongoing	Cal-DTSC, EPA	Tracking of hazardous waste shipments across the border. Training on California requirements of hazardous waste shipment and management. Coordination with San Diego and Imperial Counties. Technical assistance to Mexico. Support federal prosecutors and local District Attorneys' investigations and enforcement.
Investigations of import/export of hazardous waste shipments	Ongoing	San Diego County HMMD, U.S. Customs, California Highway Patrol, California DTSC	Staff of HMMD conduct investigations of import/exports of hazardous waste shipment between California and Mexico for conformance with applicable laws and regulations, focused on all California-Mexico border crossings.
POLLUTION PREVENTION			
TRADEX (Transborder Assistance for Developing Environmental Excellence)	1994-1995	San Diego Co. Dept. of Environmental Health (DEH), EPA, UCSD	Conducted pollution prevention audits of Tijuana's manufacturing industry; coordinated a conference in Tijuana on the benefits of pollution prevention and environmental management systems; worked with the University in Tijuana to include pollution prevention in their publications; developed a pollution prevention session at the National Maquiladora Assn.'s annual conference.
Conference on Environmental Management Systems: Compliance and Pollution Prevention	1995	EPA, San Diego County Dept. of Environmental Health, Industrial Environmental Assn. of San Diego	One-day conference to assist border industries in implementing or improving environmental management systems.

TABLE 4.3
PAST AND ONGOING PROJECTS - CALIFORNIA-BAJA CALIFORNIA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Exposition on Aqueous Cleaners and Other Alternatives	1995	Cal-DTSC, BECA, Southwestern College, San Diego County, EPA	Showcased alternatives to chlorinated and chlorofluorocarbon solvents for cleaning applications targeting businesses using solvents on both sides of the border.
Technical assistance to Mexican environmental agencies	1996-1997	Cal-EPA, EPA	Provide training on pollution prevention to state and federal agencies in Baja California.
Industry workshop on pollution prevention techniques	1996-Ongoing	Cal-DTSC, EPA, PROFEPA	Provide workshops to California - Baja California border industries on pollution prevention techniques.

Objectives for the Next Five Years

Natural Resources

- Promote training, assessment, and research on habitats and species of flora and fauna. Initiate habitat protection programs that emphasize biodiversity and sustained use in the California-Baja California region. Prioritize habitat management planning and implementation.

- SEMARNAP will implement management plans for the Constitución del 1857 National Park and the Alto Golfo de California-Delta del Rio Colorado Biosphere Reserve, and establish organizational structures and oversight and inspection units. These plans will include design strategies for the long-term financial maintenance of these protected areas and promote projects and activities that offer an alternative for economic sustainable development for inhabitants who live close to these areas.

- Pursue opportunities for collaboration in developing windbreaks around agricultural lands as well as the development of commercial plantations for wood products and nonwood products (e.g. jojoba, Christmas trees, etc.). Increase training and outreach in nursery management and reforestation practices. Mexico is particularly interested in U.S. technical assistance in establishing plantations in the Tijuana, Mexicali, Guadalupe, and Tecate areas.

- Implement an assessment procedure for evaluating desertification processes for those existing reforestation activities to ensure effective results related to the prevention and control of desertification phenomenon.

- Establish an aquaculture program for rural areas that includes a training component for the inhabitants of the region.

- Design and establish a pollution monitoring program in the California-Baja California coastal zone to determine the actual state, trends, and the concentration of critical contaminants that may be impacting the natural resources shared by both countries.

- Establish standards for the import, export, and quality control of aquatic and marine species utilized for aquaculture and fishing.

- Conduct specialized research on aquaculture to define management plans and sustainable utilization of resources of mutual interest to both countries.

- Incorporate aquaculture activities that are productive with minimum environmental impacts, that benefit local populations, and that promote the conservation of endemic, rare, and/or endangered aquatic species.

Water

- The International Wastewater Treatment Plant (IWTP), now under construction, is part of a regional solution that will play a large part in restoring the environmental quality of the Tijuana River Valley, protecting the water quality of the ocean and the area's beaches, and safeguarding the health of the area's residents.
  - The advanced primary treatment facilities should be completed by March 1997, and the ocean outfall should be completed by June 1998.

  - Responsible authorities will develop and implement an industrial wastewater source control program to minimize the release of toxic pollutants into the sewer system or water bodies and ensure proper operation and maintenance of the IWTP so as to protect the health of local residents, habitats and natural resources.

  - Tijuana will implement a City Sanitation Plan which contemplates wastewater collection, treatment, and reuse for industry or agricultural irrigation.

- To address the wastewater needs in Ensenada, a new wastewater treatment plant will be constructed in the near future.

- The wastewater situation in the New River area calls for an action plan that includes short-term actions to make immediate improvements to the existing Mexicali system and examines options for long-term solutions to wastewater infrastructure deficiencies.
  - Short-term projects to improve the existing system will be identified and constructed or implemented, if they lead to an immediate improvement in the amount or quality of treated effluent or a reduction of raw sewage in the New River.

  - A facilities plan will be prepared that presents the technical, financial, social, and environmental aspects of the available project options through the year 2000.

  - CNA, Baja California's Secretariat of Human Settlements and Public Works, EPA, IBWC, the California State Water Resources Control Board, the Colorado River Basin Regional Water Quality Control Board, Imperial County, and the Imperial

Irrigation District must work together with the BECC and NADBank to assist the affected community in devising solutions to the wastewater infrastructure problem which take into account the entire watershed and the relationship between water supply and wastewater.

- In conjunction with developing solutions to the wastewater infrastructure situation, responsible authorities must develop and implement an industrial wastewater source control program to minimize the release of toxic pollutants to surface and groundwaters.

➤ The municipalities of Mexicali, Tijuana, Tecate and Ensenada receive their drinking water supply from the Colorado River. To address water quality concerns in the Colorado River and New River systems, both governments, in conjunction with regional, state, and local authorities, are conducting a study to determine the level of toxic pollutants in the lower Colorado River and in the New River and will continue to monitor conventional water quality.

➤ The IBWC will continue to implement agreements that exist between the U.S. and Mexico to find a solution relating to the salinity problems of the Colorado River and thereby contribute to the improvement of the ecosystem along the river, and of the ecosystem in the delta where it discharges.

Environmental Health

➤ In depth discussion of binational, geographic-specific five-year objectives have only commenced in earnest with the issuance of the *Border XXI Framework Document*. The intent is to translate the overall environmental health objectives outlined in Chapter III into objectives, priorities, and projects specific for this region benefiting from further binational discussions and the input obtained from community outreach meetings. The following is an example of an activity that will be developed for this region.

➤ Building on the successful and cooperative relationship between the California Department of Pesticide Regulation and Baja California authorities, EPA, Mexico's Secretariat of Health, and SEMARNAP through CICOPLAFEST plan to support these agencies in developing and implementing programs to minimize risk to human health and the environment from the use of pesticides. Development and implementation of the following programs could help meet this objective:

- an emergency response strategy for pesticide-related incidents along the border;
- a notification and information exchange strategy for pesticide residue detection on both sides of the border;
- a food safety information exchange strategy;
- general pesticides regulation and information exchange;
- a strategy and system to track pesticides obtained in California and used in Mexico, and vice versa; and

- development of a training program on pesticides management that includes applicators and field workers.

Air

➤ Given the recent increases in population, vehicular traffic, and industrial activity in the San Diego-Tijuana air basin, there is an ongoing need to evaluate levels of PM-10, CO, and ozone air pollutants targeted as problems in the area. In order to meet the goal of attaining health-based ambient air standards, the California-Baja California Air Subgroup will build on existing efforts to promote regionally based:

- air quality monitoring networks;
- development of emissions inventories;
- use of models and strategies as tools to improve air quality;
- air quality improvement strategies intended to serve as useful tools for local decisionmakers as they grapple with the interrelationships among air quality, land use, transportation planning and economic development; and
- ongoing involvement of local communities (e.g., government, private sector, academia, NGOs), the people directly impacted by air pollution.

Hazardous and Solid Waste

➤ SEMARNAP will facilitate projects that result in the construction and operation of environmentally responsible controlled landfills for hazardous and industrial waste to build waste management capacity.

➤ Proper management, treatment and disposal of hazardous and solid waste and compliance with regulations for transboundary shipments of hazardous waste will remain a priority for the San Diego-Tijuana and Mexicali-Imperial Valley regions. Continued cooperation among the state and local offices will focus on:

- ongoing information and technology transfer;
- cooperative training;
- building laboratory sampling and analysis capabilities;
- developing recyclables markets; and
- using and improving HAZTRAKS as a tracking and compliance tool.

➤ One of the principal actions will be to improve waste management practices in the California-Baja California region and promote solid and hazardous waste minimization and recycling. This will be accomplished by:

- developing partnerships with industry to encourage waste minimization and safe material management;
- providing site-specific compliance and technical assistance on an as-needed basis;
- training government officials, community leaders, and industry on waste reduction and pollution prevention.

Contingency Planning and Emergency Response

➤ Both governments will develop state and local capacity for contingency planning, as well as emergency response in the areas of San Diego-Tijuana and Calexico-Mexicali. This will be accomplished through the Joint Response Team which involves federal, state and local agencies with responsibilities for dealing with environmental emergencies through implementation of the Joint Contingency Plan in these sister cities, the creation and promotion of CLAMs, the creation and equipment of communication and emergency response centers, training of staff involved in emergency response, and communication with the public, among other activities.

Environmental Information Resources

➤ Building on the existing San Diego-Tijuana GIS projects, promote greater integration between academic groups, and governmental and nongovernmental organizations on both sides of the border. Future efforts will focus on demographic data such as the number of residents with access to sewer systems.

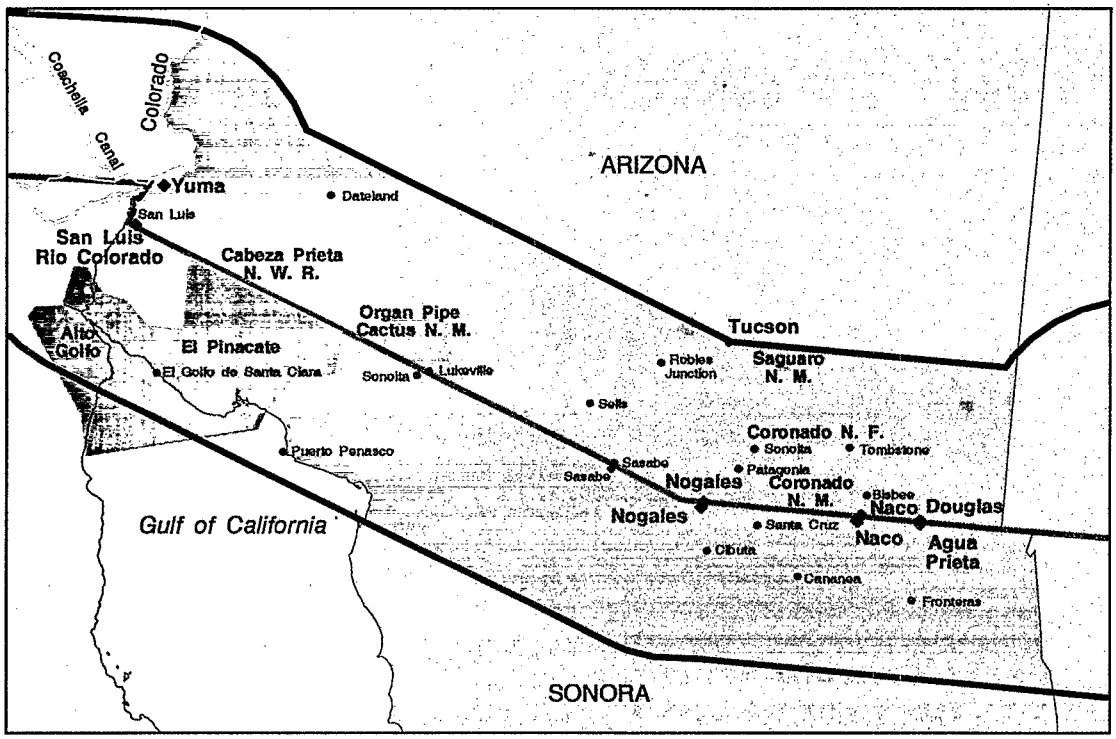
Cooperative Enforcement and Compliance

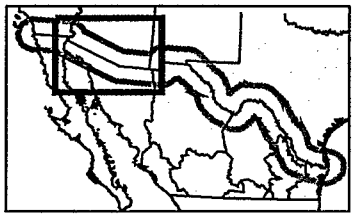
➤ The California-Baja California Cooperative Enforcement Subgroup, with the close collaboration of EPA and PROFEPA, will promote interagency and binational cooperation among all relevant local, state and federal authorities involved in environmental enforcement. Such cooperation will seek to enhance effective enforcement and promote compliance with environmental laws, consistent with the objectives of the Cooperative Enforcement Workgroup outlined in Chapter III. The subgroup will develop annual action plans for implementing cooperative projects. The independent enforcement and compliance activities of the various authorities will be coordinated with these efforts.

➤ The PROFEPA inspection program expects to carry out 3,700 inspections between 1996 and 2000 to monitor regulatory environmental compliance.

➤ The California Environmental Protection Agency (Cal-EPA), with the support of EPA, has organized a multimedia enforcement task force to coordinate efforts of all state, local, and federal enforcement agencies with jurisdiction in the California border area. The state of California and Imperial County will cooperatively execute enforcement activities and investigations in Imperial County.

Arizona-Sonora Region





- City
- Sister City
- State Boundary
- U.S./Mexico Border
- 100km Buffer
- Water Body
- Protected Area

CDSI

Map created by CDSI
September 25, 1996

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100 0 Miles

Sources: Digital Chart of the World, TNRIS, National Parks Service

EPA Region 6
GIS Team
Dallas, Texas

CHAPTER V

ARIZONA-SONORA

In order to promote a regional approach to environmental problem solving, this chapter focuses on environmental issues and problems, past and ongoing projects, and objectives that are specific to the Arizona-Sonora area of the border region. The borderwide objectives and ongoing activities described in Chapter III also pertain to the Arizona-Sonora border region.

Brief Overview

The Arizona-Sonora border region includes five areas of concentrated population, which are also the locations of the five principal border crossings, and a sovereign Indian nation. The urban areas are Yuma-San Luis Rio Colorado; Lukeville-Sonoita; Nogales-Nogales; Naco-Naco; and Douglas-Agua Prieta. The Tohono O'Odham Nation is located between Organ Pipe Cactus National Monument and ambos Nogales.

TABLE 5.1
POPULATION

Population Center	1980 Population	1990 Population	1995 Population
Yuma, Arizona	42,000	55,000	60,000
San Luis Rio Colorado, Sonora	93,000	112,000	133,000
Nogales, Arizona	15,700	19,500	20,700
Nogales, Sonora	68,000	107,000	133,500
Douglas, Arizona	12,800	13,000	14,800
Agua Prieta, Sonora	34,400	39,000	56,000
Naco, Arizona	Not Available	700	870
Naco, Sonora	4,400	4,600	4,900
Tohono O'Odham Nation	Not Available	17,300	19,000
Total	270,300	368,100	442,770

- 1980 and 1990 population figures for Arizona come from 1993 Arizona State Almanac.

Notes for Table 5.1 Population

- 1980 and 1990 population figures for Mexican cities come from INEGI X & XI Census of General Population and Housing. For 1995, the data was obtained from the 1995 INEGI Count of Population and Housing.
- 1995 estimate for population in Arizona cities comes from Arizona Department of Economic Security (except Naco which comes from the 1994 Rand McNally Commercial Atlas).
- 1995 estimate for Tohono O'Odham Nation comes from the Bureau of Indian Affairs.

The Sonoran Desert and the Mexican highlands-Sierra Madre Occidental are part of this region. The Sonoran Desert includes southcentral and southwestern Arizona and southeastern California, extending into Sonora. The Mexican highlands-Sierra Madre Occidental cover central and eastern Sonora and portions of Arizona and New Mexico, and include grassy plains with semi-desert pastures and both arid and forested mountains.

The Sonoran Desert is rich in diversity of flora and fauna. The rugged topography, variety of substrates, and scarcity of water bodies, deciduous and perennial forests, small trees with cactus, and elements of subtropical fauna and flora of the Sierra Madre Occidental maintain a diversity of species of fish and wildlife as well as plant communities. These include threatened and endangered, rare and unique species. More than 560 vascular plant species have been identified in the Sonoran Desert.

The upper region of the Gulf of California maintains diverse marine species that are in danger of extinction. It is also the breeding grounds for commercial species that depend on the estuary of the Colorado River.

Surface water resources in this area include the Lower Colorado River which drains to the Gulf of California and supports the Cienega de Santa Clara, Sonoita Creek, Santa Cruz, Magdalena, San Pedro, and Yaqui Rivers. Groundwater resources are principally aquifers associated with the river systems or as independent hydrologic systems in the Mexican highlands basins.

The biodiversity of the borderland region is well represented in the following special management areas: Cabeza Prieta, Buenos Aires and San Bernardino National Wildlife Refuges, Organ Pipe Cactus National Monument, Coronado National Monument, Coronado National Forest, San Pedro Riparian National Conservation Area, Tohono O'Odham Indian Nation in Arizona, Alto Golfo de California-Delta del Rio Colorado and El Pinacate-Gran Desierto de Altar Biosphere Reserves, and Sierra de los Ajos, Buenos Aires and La Purica National Forest Reserve in Sonora. With the exception of the Tohono O'Odham Nation, all of these areas are operated and managed by federal agencies in collaboration with state agencies and surrounding communities to achieve cooperative conservation and sustainable resource management. In addition, there are other protected areas in the region managed by federal and state agencies.

Environmental Issues and Problems

Natural Resources

Three primary habitat types are critical to the biodiversity of the Arizona-Sonora border region: riparian and aquatic areas, grasslands, and mountain "Sky Island." These areas are threatened by human-related activities which ultimately affect the biodiversity of this geographic region. The illegal extraction of wild flora and fauna species, and the introduction of exotic species that alter natural habitat are ongoing problems in both countries.

The Pinacate-Gran Desierto de Altar Biosphere Reserve is confronted by illegal extraction of species, especially cacti, introduction of exotic species like Buffelgrass, and poaching. In addition, cattle grazing alters the indigenous vegetation, and the unregulated extraction of volcanic ash known as morusa, which is utilized in the construction industry, has adverse impacts on the topography and vegetation. The increased tourism to this area has the potential to adversely impact natural resources and needs to be properly managed.

The Colorado River, which originates in the United States, is a major source of water supply for multiple uses by both countries in the Arizona-Sonora area. There is a need to protect the quality and quantity of this important water supply resource.

The delta of the Colorado River in Mexico is one of the world's great desert estuaries and supports vast freshwater, brackish, and intertidal wetlands in this most arid portion of the Sonoran Desert. These wetlands contain the only populations of substantial size of endangered species, such as Desert Pupfish and Yuma Clapper Rail, and represent important wintering habitat for migratory waterfowl. Some of the brackish wetlands are not natural marshes but are the incidental creations of water management decisions in the U.S. and Mexico. The marine zone of Alto Golfo de California-Delta del Rio Colorado Biosphere Reserve is an important area for the protection of rare and threatened marine species that constitute a rich source of biological diversity, some of which have been affected by overexploitation. There is a need to continue management efforts for the protection of these resources.

The Natural Protected Area designation in Mexico allows for regulated moderate use of renewable resources, much like the USDA Forest Service multiple use philosophy. Natural resource managers in Sierra de Los Ajos are faced with the challenge of maintaining a balance between the need to harvest forest commodities and the protection of the unique environment.

General concerns with respect to forestry and soil conservation in this region include the need to control soil erosion, loss of forest land due to slash and burn agriculture, grazing management, conflicts with threatened and endangered species (i.e. introduction of Buffelgrass), and the need to protect some species and/or areas from overutilization (e.g. ironwood is valued for carvings, and mesquite is used to make charcoal for domestic use and for export to the United States). In Mexico, there is a need to develop valuable products other than sawlogs (such as mesquite, willow for baskets, etc.) for local sale or export. There is also a need to address the conflicts of traditional uses of threatened and endangered species among the indigenous people.

Water

The lack of basic inventory and monitoring information pertaining to border water resources and water-dependent environments prevents a comprehensive understanding of watershed and regional natural resource issues. Lack of quantitative information concerning the natural recharge and the possible limitations of many of the groundwater supplies lead to uncertainties as to the future of these water resources. State, federal, and international divisions of the affected jurisdictions make water management a complicated task, especially in the absence of sound hydrologic data and assessments. Increased groundwater pumping and agricultural development have affected draw-down of natural desert springs and impacted the propagation and management of endangered fish species.

In the western area of the region, the local community expressed concern that the Colorado River Delta lacks a comprehensive environmental management plan which could, among other things, address the impacts of water quantity and quality from the Colorado River on the northern Gulf of California, on communities dependent upon the northern Gulf of California, the local fishing industry, and threatened or endangered species in the area.

Residual flows from the Colorado River into Mexico, along with irrigation return flows and brine waters have greatly affected the ecology of the Upper Gulf of California and the Cienega de Santa Clara. Preserving the remaining wetlands will require a binational water management plan for flood and irrigation-return fresh water inflow into the delta. Seawater spills into this basin only during the highest tides or during storm surges. Tidal effects alone may not push the saltwater northward for sufficient quantities to reach this unique wetland area.

Since the area around Yuma-San Luis Rio Colorado is primarily rural and is composed of many small communities, the people living in the area have special needs. U.S. communities in the area highlighted the fact that EPA must redirect some of its attention from large urban communities to address the specific needs of small communities. The needs identified include technical and financial assistance, awareness and attention to local conditions, and assistance in the design and construction of water lines and sewage treatment systems.

In San Luis Rio Colorado, construction of a wastewater treatment plant is needed as growth has surpassed infrastructure capacity. Discharges to the Colorado River which present potential risks to public health, the river environment, the northern Gulf of California and nearby estuaries, will continue until completion of a collection and treatment system for waste and agricultural waters.

Located nine miles north of the international boundary, the Nogales International Wastewater Treatment Plant (NIWTP) is an aerated lagoon system[1] that treats sewage from Nogales, Arizona and Nogales, Sonora. The IBWC operates the NIWTP. The effluent from the treatment plant enters the Santa Cruz River which flows north and supports a riparian corridor. Nogales, Sonora is utilizing its full capacity allotment at the treatment plant and requires additional capacity. Deficiencies in the current Sonora collection system result in raw sewage flows and nonpoint runoff into the Nogales Wash and into an adjacent wash, which flows through downtown Nogales, Sonora and Nogales, Arizona.

The public has expressed significant concern about direct public exposure to contaminated water in the wash. Monitoring studies have found high fecal coliform bacterial levels, ammonia, heavy metals, and the parasites *Giardia* and *Cryptosporidium*. The potential for groundwater contamination by percolation of contaminated surface water into the shallow alluvial aquifer along the Nogales Wash raises additional public concern. Preserving drinking water quality is a high priority for the ambos Nogales community. ADEQ's records show that city-owned wells in Nogales, Arizona, provide quality water since the Nogales, Arizona, municipal wells tap into a deeper aquifer and are not directly threatened by the potential pathway for groundwater contamination associated with the Nogales Wash. However, a portion of Nogales, Sonora's municipal drinking water comes from the shallow aquifer, and several shallow private wells in the U.S. are located near the Nogales Wash. These latter wells include the privately owned public water system known as the Valle Verde Water

[1]The system has a capacity of 753 LPs (17.2 mgd).

Company, which serves a substantial portion of the 13 percent of Nogales, Arizona's population that does not receive its drinking water from the city of Nogales' system. The Valle Verde system is important to the entire community however, as it has been identified as one potential future drinking water supply that could be purchased to augment the city of Nogales' system.

Water quality concerns in this area are not limited to the Nogales Wash. Because most residents of Nogales, Arizona, get their drinking water from two sets of wells, one located along Potrero Creek and the other located along the Santa Cruz River near Highway 82 bridge crossing, water quality in these basins is of concern. Potrero Creek is a tributary of Nogales Wash, which, in turn, is tributary to the Santa Cruz River, with a confluence downstream of the city's Santa Cruz wells. Although the Potrero Creek and Santa Cruz River watershed are not nearly as developed as the Nogales Wash watershed, the Nogales-Santa Cruz Wellhead Protection Program has identified a number of potential sources of contamination in these areas. In addition, many in the community recognize that if the significant development which is expected to occur as a result of NAFTA takes place in a manner that is not sensitive to drinking water quality protection, then these wells may face serious water threats in the future.

Changes in land use and infrastructure development along the Santa Cruz River will alter the aquatic fauna and flora along the riparian greenbelt. The problems associated with insufficient data are well illustrated in the uncertainty surrounding the Santa Cruz and San Pedro River systems, where the understanding of the origin of surface flows, the groundwater/surface water relations, and the importance of the riparian systems, is very poor.

The San Pedro River originates in Mexico in a ranching, agriculture, and mining area, and flows into the U.S. adjacent to a rapidly expanding urban/military complex. Most land uses along this river have put major demands on water within the river basin, while impacting the water quality and biodiversity of the basin. The riparian corridor along the river may be in danger from lack of in-stream flows.

The water requirements of the mining industry, the Riparian National Conservation Area, municipalities, industry, military, and agriculture are all dependent on the same interrelated water source. The withdrawal of groundwater, the principal source of water supply for municipalities, industries, mining, and agriculture, is greater than the natural basin recharge.

Douglas and Bisbee residents have indicated a need for rehabilitation of the drinking water distribution system in both cities. Questions have been raised regarding treated sewage discharges from Douglas into the Whitewater - Arroyo Agua Prieta. Sewer system and wastewater treatment rehabilitation is also needed in Naco, Arizona. Citizens of these communities raised concerns that EPA must redirect some of its attention from large urban communities to address the specific needs of small communities, as small communities do not have the population or tax base to support their infrastructure needs. With regard to groundwater, there is some community concern that abandoned and active mines in the Douglas-Agua Prieta and Naco-Naco area may be a source of contamination, though current data does not indicate a health hazard. Additional water-related concerns in the region center around the need for protection of the area's drinking water supply. Surface water quantity and quality are important issues in the area.

Through analysis of the region's water infrastructure needs, CNA found that for the five most populous Mexican cities in the region (Nogales, Agua Prieta, Naco, Sonoita and San Luis Rio

Colorado) 86 percent of the population receives quality drinking water, 62 percent of the residences are connected to a sewer system, and 41 percent of the total wastewater is treated (although in many cases the operation and maintenance of treatment systems is deficient). At this time, CNA has estimated resource requirements to meet the region's present infrastructure deficiencies as shown in Table 5.2.

TABLE 5.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short Term 1998-1999	Medium Term 2000	Total
Drinking water	5.0	19.0	18.0	42.0
Sewer systems	2.0	4.0	10.0	16.0
Treatment	1.0	7.0	5.0	13.0
Consolidation	6.0	1.0		7.0
Increased efficiency	2.0	3.0	3.0	8.0
Studies and projects	0.6	0.5	0.2	1.3
Total	16.6	34.5	36.2	87.3

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

Environmental Health

The Arizona-Sonora border region, like the entire U.S.-Mexico border region, is grappling with several serious public health problems that are or may be associated with toxic environmental exposures. Contamination of air, water, and soil by heavy metals, volatile organic compounds (VOCs), hazardous waste, pesticides, nitrates, and bacteria are believed to be key factors contributing to the presence of environmentally related diseases in populations residing in Arizona-Sonora communities. Although community-specific problems do exist, most communities in the Arizona-Sonora border region face similar environmental health problems.

Chief among these problems are the following: respiratory infections, particularly asthma; elevated blood lead levels in children; multiple myeloma, a form of bone-marrow cancer; systemic lupus erythematosus (SLE); hepatitis A; diarrheal diseases and other enteric infections, such as *Giardiasis* and *Amoebiasis*; and pesticide poisonings.

Community-specific health concerns, however, clearly exist. These include pesticide-related illnesses in the Yuma-San Luis Rio Colorado area, where agricultural production is the principal economic activity and aerial spraying occurs year round. In ambos Nogales, inadequate sewerage and breaks in the existing system, particularly during periods of heavy rainfall and ensuing flooding, result in raw sewage flows in the Nogales Wash. The wash flows directly through downtown ambos Nogales, creating a breeding ground for infectious disease. In the Douglas-Agua Prieta area, past mining

activities, specifically toxic emissions from a smelter in the Dougals-Pirtleville area, are believed to be associated with previously high blood lead levels in children and lung cancer in smelter workers.

At present, relatively little scientific data exists in the Arizona-Sonora border region to establish a definitive link between pervasive chronic diseases and environmental exposures. Nevertheless, a perception prevails among many residents of Arizona-Sonora border communities that environmental contamination and concomitant exposure are responsible for many of the health problems that people are experiencing. In an effort to ascertain the prevalence and incidence of suspected environmentally related diseases as well as causal factors, the Arizona Department of Health Services, in collaboration with other entities, such as the University of Arizona College of Medicine, Sonoran Ministry of Health, and local health departments in Arizona and Sonora border communities, are currently undertaking binational epidemiological studies on the issues of air quality and asthma, lupus, and multiple myeloma. (See Table 5.3 on Ongoing Projects.)

A document containing information on community-specific environmental health concerns in the Arizona-Sonora border region is available from Lee Bland, Chief, Office of Environmental Health, Arizona Department of Health Services, 3815 N. Black Canyon Highway, Phoenix, AZ 85015.

Air

Since air quality monitoring began in 1985, both the 24-hour and annual PM-10 National Ambient Air Quality Standards (NAAQS) have been violated in the Yuma, Nogales, and Douglas areas. In accordance with the Clean Air Act, ADEQ has prepared a State Implementation Plan for the area identifying specific control measures and mechanisms for implementation to bring the Yuma area into attainment of PM-10 NAAQS and maintain the NAAQS through the year 2000. The NAAQS Plans for Nogales and Douglas have yet to be prepared.

Currently in Mexico, there is no guidance by which to determine "nonattainment" with Mexican air quality standards. Additionally, there is insufficient air quality monitoring data to determine if Mexican cities meet the Mexican air quality standards. Aside from these limitations, Nogales, Agua Prieta and San Luis Rio Colorado, Sonora potentially do not meet Mexican air quality standards for particulates and Agua Prieta, Sonora potentially does not meet the standard for SO_2. This is based on knowledge of sources and their potential emissions.

The primary concern in the Arizona-Sonora area is an increase in air pollution from mobile sources, particularly due to the increased transborder traffic congestion at border crossings. Additional concerns relate to emissions from manure burns and the burning of wire casings for the recycling market. There are numerous other emissions sources including industrial sources, residential fuel combustion, waste disposal (refuse burning), fires (wildfires, prescribed burning, structural fires), and agricultural production.

Hazardous and Solid Waste

Through the Border XXI Program public outreach meetings, it became evident that there is much concern in the Arizona and Sonora border communities about the types, quantities and destinations of hazardous materials and wastes. Community and government concerns stem from the high number

of crossings of the Arizona-Sonora border and projections that commercial transportation across the international boundary will likely increase with the phase-in of NAFTA.

There have also been historical concerns in the region about toxic emissions from uncontrolled burning at a former solid waste disposal site in Nogales, Sonora. Located just a few miles south of the border and the neighboring community of Nogales, Arizona, the site had been the source of emergency health warnings by Santa Cruz County during certain intervals of burning. The government of Mexico has now constructed a new sanitary landfill more than 15 miles (25 kilometers) from the border for Nogales, Sonora, making it possible to close the old landfill. However, the burning of manure in the stockyards located along the border in Nogales, Sonora, has concerned officials in the U.S. and Mexico.

Contingency Planning and Emergency Response

Currently, the need for emergency response capabilities, particularly with regard to expertise and equipment, is greater in the Sonoran cities than in the Arizona cities. The emergency response training and equipment needs are highlighted by the fact that the sister cities in this region are spread out along the border and are relatively distant from other large cities in the interior of both countries. Thus, the sister cities require their own emergency response capabilities; they cannot depend upon other cities inside or outside the region.

In contrast to other sister cities, Yuma and San Luis Rio Colorado are located approximately 20 miles (32 kilometers) apart, with San Luis Rio Colorado on the international boundary and Yuma to the north. Because there is a single road to and from the border crossing, delays are common, and hazardous materials and waste are transported through residential neighborhoods, raising concerns about emergency response capabilities.

Yuma and San Luis Rio Colorado have coordinated emergency response efforts. The city of San Luis Rio Colorado has trained and exercised with the Yuma Fire Department. The Yuma Fire Department responders have crossed the border to support San Luis Rio Colorado and vice versa. The Yuma Fire Department has been able to provide preowned but reusable resources to the San Luis Rio Colorado Fire Department over the last several years and has received excellent fellowship in return. The Yuma County LEPC has also supported a number of hazardous materials response and contingency planning efforts along the border of Arizona-Sonora and Yuma-San Luis Rio Colorado sister cities. The Arizona Emergency Response Commission, through the U.S. Department of Transportation, has provided training in Arizona and San Luis Rio Colorado, Sonora has received first responder operations procedures interfaced with mutual aid and standard operations procedures.

There are currently three fully equipped hazardous material emergency response teams in the Yuma area. The Yuma County fire departments have been awarded a total of $26,983.00 in grant funds from Arizona Emergency Response Commission to purchase equipment.

Environmental Information

Through the Border XXI public outreach meetings, citizens in the Arizona-Sonora sister cities expressed a need for increased education and awareness regarding general, regional, and local environmental issues including air, water, waste, natural resources, health impacts from environmental

degradation, and the relationship between the environment and quality of life. Many members of the Arizona-Sonora border community consider lack of information and general environmental awareness on local and regional problems and solutions an impediment to raising environmental quality and increasing public involvement in preventing and solving environmental problems. Similarly, throughout the region there was a call for pollution prevention information which is tailored and delivered to appropriate domestic and industrial audiences.

Cooperative Enforcement and Compliance

Because of the growing concentration of population and industrial activity, compliance with environmental requirements is essential for health and welfare in the area. Local, state and federal agencies involved in enforcing environmental laws and promoting compliance can improve their effectiveness through cooperation.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NATURAL RESOURCES			
Surveys to document life history and habitat needs of the Sonoran pronghorn and to complete a management plan for the subspecies in Sonora	1995-1996	FWS, INE, U of A, AGFD; NPS	A management plan for the protection of the pronghorn antelope. More specific information obtained on the life history of the Sonoran pronghorn.
Sonoran pronghorn antelope conservation	1995-1996	FWS, INE, NPS, AGFD	Continue conservation efforts with various partners for the Sonoran pronghorn.
Masked quail conservation	1995-1996	FWS	Continue conservation efforts for the masked quail habitats.
Biodiversity conservation and protection, southern Arizona	1995-1996	FWS	Continue to protect and manage flora and fauna in southern Arizona.
Restoration of riparian habitat along the Santa Cruz River	Ongoing	FWS	Initiated riparian restoration projects with partners along the Santa Cruz River.
Conservation and management of native fishes in southern Arizona	Ongoing	FWS, AGFD, INE	Continue to survey Sonoran Desert streams. Determine population trends for native fishes.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Restoration of wetlands habitat along the lower Colorado River	1995	FWS	Improve habitat through revegetation along the lower Colorado River.
Environmental education and public outreach program	Ongoing	NPS, INE, Sonora state government, IMADES, UAS, Sonoran Institute	Design and development of special environmental education programs for neighboring U.S.-Mexico communities adjacent to the Organ Pipe Cactus-El Pinacate Reserve regarding function and management of protected areas. Held public town hall meeting in the vicinity of Organ Pipe Cactus National Monument to discuss joint U.S.-Mexico conservation efforts and issues.
Coronado NF /State of Sonora Sister Forest Partnership	Ongoing	USFS- Coronado NF, SEMARNAP - Sonora	Forest health detection and treatment of insects. Provide GIS training and use this and GPS technology to improve mapping information in Sonora. Fire prevention, prescribed burning, and reforestation training. Complete a statewide forest inventory and range management plan.
Management of Sierra de Los Ajos Forest Reserve	Ongoing	USFS-Coronado NF, SEMARNAP, IMADES	Develop ecosystem management plan for Sierra de Los Ajos with emphasis on fire management.
Reintroduction of Gould's turkey	Ongoing	USFS-Coronado NF AGFD, FWS, SEMARNAP-Sonora	Reintroduce Gould's turkey, an extirpated species in U.S., into the Coronado NF, Sonora. Train Mexican biologists from Chihuahua, Sonora, and Durango.
Forest health monitoring	Ongoing	USFS-Coronado NF SEMARNAP-Sonora and Chihuahua	Improved identification and management to reduce effects of pine bark beetles, cronartium rust, and dwarf mistletoe.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Fire ecology	Ongoing	USFS-Coronado NF, Prescott NF, RMRS U of A, UAS SEMARNAP-Sonora.	Host symposium of fire effects in Madreem Archipelago in 1996. Demonstration areas and management practices to highlight important role of fire in maintenance of this ecosystem.
Biodiversity of Madreem Archipelago	1995	USFS-Coronado NF, RMRS, USGS, INIFAP, SEMARNAP and various U.S. & Mexican universities,	International symposium on management of the biological resources of the Sky Islands.
Sensitive species inventory	Ongoing	USFS - Coronado NF, USFS - RMRS, NRCS, AGFD, NMDFG Malapai Borderlands Inc.	Inventory sensitive plant and animal species and evaluate the effects of fire management activities on these species within the Arizona and New Mexico borderland area.
Management program for the Alto Golfo de California, Delta del Rio Colorado Biosphere Reserve	1994-1995	INE, CICTUS, CES, CIDESON, CEDO, COLEF, UABC, INP, CICESE, PRONATURA, A.C.	This program guides the actions in the Reserve and that was agreed to by local communities, local authorities, and NGOs.
Management program for El Pinacate - Gran Desierto del Altar Biosphere Reserve	1994-1995	INE, CES, CEDO, UABC, UNISON, INAH, Tohono O'Odham Nation	This program guides the actions in the Reserve and that was agreed to by local communities, local authorities, NGOs, and indigenous groups.
Sierra de los Ajos, Buenos Aires, and La Purica (Bavispe) National Forest Reserve	1993	SFFS SARH, Wildlife Society of Mexico	A flora and wildlife study was conducted as well as an analysis of natural resources and topography.
Inventory of the coastal- marine flora and fauna of the northeastern Gulf of California	1995	INE, ITESM	A species list was generated of vascular plants present in the coastal zone of the Alto Golfo in the state of Sonora, saltwater fish, macroinvertebrates, mammals, and marine and coastal birds and reptiles. A species distribution map was also generated.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Analysis of the status of the flora in riparian habitats in the northern border zone - Sonora	Ongoing	INE, CICTUS	Inventory of the flora of riparian habitats, through a review of relevant literature and scientific collections.
Status and distribution of the spotted owl - Sonora	1994	INE, FWS, CES	Conduct a population and distribution study of the spotted owl in Sonora.
Status of the desert tortoise - Sonora	1994	INE, FWS, CES	Understand the status of the population of the Desert tortoise in Sonora.
Evaluation of the big horn sheep population and determination of the harvest rates in Sonora	1994	INE, FWS, CES	Understand the structure of the population and determine rates of use of the big horn sheep in Sonora.
WATER			
Lower Colorado River/New River data synthesis	1995-1996	EPA, UCD	EPA has issued a grant to UCD to prepare bilingual reports summarizing and synthesizing existing water quality data for the Lower Colorado and New Rivers.
Lower Colorado River-New River toxics survey	1994-1996	EPA, USGS, IBWC, UCD, DFG, Arizona, CNA, IBWC	Two rounds of water, sediment and fish tissue samples have been collected on the Lower Colorado River. The first round of samples has been collected on the New River.
Nogales wellhead protection	1993-1996	SEAGO, ADEQ, Santa Cruz County, future involvement to be determined	Six wellhead protection areas have been identified for Nogales, Arizona, and potential sources of contamination mapped. A set of teaching plans and a general public education plan have been developed.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Nogales groundwater monitoring	1993-1996	ADEQ, IBWC, EPA, CNA, Sonora	Wells on U.S. side have been drilled. Mexican partners will continue working with U.S. partners to install the monitoring wells in Nogales, Sonora, as part of regional hydrogeological studies.
Central Arizona basins NAWQA	Ongoing	USGS	Provide consistent description of water quality conditions, define trends, and sound scientific understanding of factors affecting water quality.
Drinking water treatment and recharge for Nogales, Sonora	1996-1998	CNA, COAPAES (Nogales)	BECC has conditionally certified the first stage of the project which will improve drinking water services. CNA will produce a document that complies with all the conditions of the BECC and NADBank.
Integrated drinking water, sewer system, and wastewater treatment plant project for Naco, Sonora	1996-1997	COAPES (Naco)	BECC has certified the project.
Nogales wastewater	1995-1996	EPA, IBWC, ADEQ, ADWR, Santa Cruz County, Nogales, Arizona, CNA, SIUE, Nogales, Sonora	U.S. Section of the IBWC has procured a contractor to develop binational facility plan. Binational policy committee and technical team (subgroups) have been formed. Study of infiltration and inflow into Nogales, AZ collection system has been initiated. U.S. Section of the IBWC has procured a contractor to prepare analysis of toxic pollutants entering IWTP headworks.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Central Arizona NAWQA	1996-1999	USGS	National Water Quality Assessment Program - Arizona, current water quality condition and trends in basins.
San Pedro basin characterization	1996-1999	USGS, state and local agencies	Defining physically based framework for the San Pedro Valley.
Hay Hollow Erosion Project	Ongoing	NRCS, Malpai Borderlands, Inc., San Bernardino NWR, Arizona State Land Department, private ranchers, Mexican farmers	Develop watershed restoration project for Hay Hollow Wash which is an area that includes lands of three private ranchers, State Land Department, San Bernardino National Wildlife Refuge and adjacent land in Sonora.
Regional H_2O quality monitoring	1996-1997	EPA, AID, ICMA	Through technical assistance and training to municipalities of Cananea, Naco, and Aqua Prieta, conduct preliminary water quality and quantity baseline testing of the San Pedro and Sonora Rivers.
ENVIRONMENTAL HEALTH			
Health consultations	1995-Ongoing	ADHS	Consultation in Nogales in process, other sites to be determined.
Arizona-Sonora Border Environmental Health GIS	1995-Ongoing	ADHS, ADEQ Local Health Departments, SSA	Draft inventory of existing health environmental and demographic databases for Arizona border region; work is beginning on developing the inventory for Sonora.
Arizona-Sonora Border Data Infrastructure Project	1996	CDHS, ADHS, SSA, local health departments	Project in development stage to improve health data infrastructure.
Ambos Nogales Asthma Study	1996	ADHS, ADEQ, U of A Nogales Unified School District	Study is in development stages; it will have research and education components.
Binational Cancer/Lupus Study	1995-Ongoing	ADHS, CDC, local health departments, SSA	Study in development stage.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Douglas/Pirtleville Blood Lead Level Study	1995-1996	ADHS, local health department, U of A, SSA	Prevalence of elevated blood lead levels in children was assessed; study found a low prevalence rate.
Binational Childhood Lead Screening Project	1995-Ongoing	ADHS, local health departments, NOSs, School Districts	Project in development stage.
Environmental Health Education Project	1993-Ongoing	ADHS, ADEQ, ATSDR, local health departments, NOSs, School Districts	Public forums; CME seminars; Educational materials development.
Binational Pesticides Project	1995-Ongoing	ADHS, ADEQ, Arizona Dept of Agriculture, Sec de Agriculture, local health department, U of A, SSA	Train-the-Trainer Program Ongoing in Yuma and San Luis Rio Colorado; will include research and education components.
Binational Community Environmental Health Workshops	1995-Ongoing	ADHS, ADEQ, SSA, SIUE	Held five workshops in Nogales, Sonora in November 1995 and in Yuma in April 1996.
Training community advisors in environmental health	1996-1997	SCERP, ASU, Red Fronteriza, El Colegio de Sonora, EPA	Development of systems approach for training environmental health advisors in Sonora-Arizona border.
AIR			
Ambos Nogales PM-10/Air Toxics Study	1994-1996	EPA, INE, ADEQ, Sonora, Douglas, Agua Prieta, ambos Nogales	Finalized particulate and air toxics ambient sampling at six sites in ambos Nogales. Emissions inventory is being developed. A draft study report should be available for public comment by the end of 1996 and will include exposure risk assessment, source attribution, and recommended control strategies.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Douglas-Agua Prieta PM-10 Air Toxics Study	1996-1997	EPA, INE, ADEQ, State of Sonora, ambos Nogales, Douglas, Agua Prieta	Initiating particulate and air toxics ambient sampling study in Agua Prieta-Douglas with sampling to occur at four sites. Emissions inventory will be developed. A draft study report should be available for public comment by summer 1998 and will include exposure risk assessment, source attribution, and recommended control strategies.
HAZARDOUS and SOLID WASTE COOPERATIVE ENFORCEMENT and COMPLIANCE **(Please see Appendix 10 for additional solid and hazardous waste projects of state and local agencies)**			
Construction of sanitary landfill; closure of open dump; construction and equipping of transfer station; acquisition of cleaning equipment and tractor trailers for transport of municipal solid wastes to the sanitary landfill; construction of mechanics workshop (Nogales)	1993-1995	SEDESOL, state and municipal governments	Completion of projects.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Preliminiary environmental evaluation for solid wastes; environmental impact assessment of sanitary landfills; integrated study of the situation for solid wastes (San Luis Rio Colorado)	1993-1994	B.M., SEDESOL, cities	Identify needs for work, infrastructure and implementation for final disposal of municipal solid wastes pilot projects.
Utilize regional geographic subgroups to implement the Hazardous and Solid Waste and Enforcement Workgroup objectives	1996-Ongoing	EPA, SEMARNAP, ADEQ, local authorities, U.S. and Mexican Customs	Development and delivery of geographic-specific projects.
Conduct hazardous waste management training	1996-1997	EPA, SEMARNAP	Increase capability of agency and industry managers and inspectors.
Improve hazardous waste field sampling and lab analysis capability (including creation of mobile lab units)	1996-1997	EPA, SEMARNAP	Improved ability to detect violations of hazardous waste management and import/export regulations.
Binational training on design, operation, and closure of municipal solid waste landfills	1993	EPA, SEMARNAP	Increased capability for management of solid waste landfills.
Technical assistance with closure of Old Nogales, Sonora solid waste disposal site	1994-1995	EPA, SEMARNAP	Technical review and assessment of site closure plan.

TABLE 5.3
PAST AND ONGOING PROJECTS - ARIZONA-SONORA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Implement a pollution prevention program for ambos Nogales (in cooperation with Pollution Prevention Workgroup)	1996-1997	EPA, SEMARNAP, ADEQ, ambos Nogales	Direct assistance to industry to implement in-house pollution prevention measures; pollution prevention award program; co-sponsored seminars attended by public and private sector environmental professionals from both countries.
Train Customs inspectors on detection of illegal transboundary hazardous waste shipments	1995-1996	EPA, SEMARNAP, ADEQ, U.S. and Mexican Customs	Increased capability by U.S. and Mexican Customs to detect and handle illegal hazardous waste shipments.
Conduct surveys of small quantity hazardous waste generators	Ongoing	ADEQ, EPA	ADEQ, through funding support from EPA, to conduct surveys of small quantity hazardous waste generators along the border to develop a multimedia industrial source inventory.
POLLUTION PREVENTION			
Technology transfer and capacity building on pollution prevention with PROFEPA	1996-Ongoing	EPA, ADEQ, PROFEPA-Sonora	Maquiladora site assistance visits are envisioned.

Objectives for the Next Five Years

Natural Resources

- Enhance protection of natural resources and long-term sustainability of flora and fauna in the Upper San Pedro River Basin. Complete a basic inventory of the flora and fauna and monitor water quality.

- Protect, restore, and manage the flora and fauna of the Arizona-Sonora geographic region to emphasize biodiversity, threatened, endangered, and native species of importance to state and tribal agencies.

- Implement management programs, educational opportunities and conservation in the following protected areas: Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge, El Pinacate - Gran Desierto de Altar Biosphere Reserve, and the Alto Golfo de California, Delta del Rio Colorado Biosphere Reserve.

- Establish the organizational structure and joint inspection committees for the Pinacate-Gran Desierto de Altar and Alto Golfo de California-Delta del Rio Colorado Biosphere Reserves. Design strategies for the long-term financial maintenance of these protected areas. Promote projects and activities that offer an economic alternative for sustainable development to inhabitants who live close to these areas.

- Pursue reforestation activities on the periphery of the most important urban areas especially in those areas that have been altered such as the municipality of Cananea. This should be done with the participation of public and private educational institutions with the end goal of fostering environmental education.

- Finalize an agreement between the Coronado National Forest, Arizona, and Sonora to pursue the coordination of firefighting brigades, and increase number of fire crews that participate in a current binational fire program between the Coronado National Forest and Sonora, particularly in Agua Prieta, Sierra de los Ajos, and Mazatan.

- Establish an aquacultural program for rural areas that includes a training component for the inhabitants of the region.

- Conduct specialized aquaculture studies to define management plans and sustainable utilization of resources of mutual interest.

- Establish policy and guidelines for the protection of aquatic species that inhabit the Alto Golfo de California-Delta del Rio Colorado Biosphere Reserve.

- Design and establish a contaminant monitoring program in the border area and the coastal zone to determine the concentration of critical contaminants that may be impacting natural resources.

- Establish standards for import, export, and quality control of aquatic and marine species utilized for aquaculture and commercial fishing.

- Restore and protect aquatic riparian corridors along the Santa Cruz River.

- Complete a basic inventory of aquatic biota and monitor the quality of water in the San Pedro River.

- Monitor and inventory native fish and aquatic organisms in the Sonora Desert ecosystem.

Water

- Pending available resources, establish binational priorities and develop a long-term joint program, through DOI, EPA, IBWC, SEMARNAP, in cooperation with state and local authorities, to systematically map and characterize the Colorado, Santa Cruz, and San Pedro surface and groundwater basins.

- Provide technical assistance, as needed, for meeting water and wastewater infrastructure needs in Yuma, San Luis Rio Colorado, and small communities in the area.

- EPA and CNA, with coordination by IBWC, and state agencies, will continue to monitor surface waters to:

  - assess water quality and the need for additional wastewater infrastructure;

  - assess groundwater contamination issues; and

  - take appropriate actions to monitor and prevent contamination.

- EPA and CNA, in close coordination with local authorities and the BECC, will support the efforts in planning and obtaining financial resources to design and construct needed wastewater treatment infrastructure in ambos Nogales to protect public health and the environment from raw sewage flows. These efforts will take the entire watershed and the relationship between water supply and wastewater into account. In future years, additional funding for this project may come from EPA or the NADBank with certification from the BECC.

- In conjunction with the development of wastewater infrastructure for ambos Nogales, further development and implementation of an industrial wastewater source control program is crucial to minimize the release of toxic pollutants to surface and groundwaters and to protect the existing and planned treatment works and its operators.

Environmental Health

- In-depth discussion of binational, geographic-specific five-year objectives has only commenced in earnest with the issuance of the Framework Document. The intent is to translate the overall environmental health objectives outlined in Chapter III into objectives, priorities, and projects specific for this region benefiting from further binational discussions and the input obtained from community outreach meetings. Some examples of the types of objectives that will be developed for this region include:

  - EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) will work closely with the Environmental Health Interagency Coordinating Committee (ICC) in their ongoing efforts to address the serious health concerns of the Nogales, Arizona, community and its potential relationship to environmental factors. The agencies will continue to work closely with the state of Arizona and the University of Arizona to study possible risk factors and conduct a community health survey.

Because of the complexity of establishing a causal relationship, more elaborate studies will likely be needed to further explore links between the environment and disease in Nogales. EPA and ADEQ will transfer environmental data to the ICC and ATSDR as it is developed, and will attempt to accelerate collection of this information as much as possible. In addition, Arizona health authorities and SSA are mounting a significant effort to provide environmental and health information to their respective communities and provide consistent medical support.

- Develop and deliver training and outreach on the proper handling of pesticides. Tailor pesticide programs developed by the California Department of Pesticide Regulation and Baja California authorities to suit the needs of the Arizona-Sonora community. Programs to consider include:

  - an emergency response strategy for pesticide-related incidents along the border;
  - a notification and information exchange strategy for pesticide residue detection on both sides of the border;
  - a food safety information exchange strategy;
  - general pesticides regulation and information exchange; and
  - a strategy and system to track pesticides bought in Arizona and used in Mexico and vice versa.

- The Sonoran Office of Agronomy, the Arizona Department of Agriculture, Enlace Ecologico, the northeast Sonora-Cochise County Health Council and others, in cooperation with school districts in northeast Sonora and southern Cochise County, Arizona, will attempt to develop Integrated Pest Management Programs in border region schools and public buildings in order to reduce the risk of exposure of school children, faculty, staff, and the general public. The projects are being conducted by the Arizona Toxics Information under contract to the Arizona Structural Pest Control Commission.

Air

- Given the physical, demographic, vehicular traffic, and industrial characteristics of the ambos Nogales and Douglas-Agua Prieta air basins, there is an immediate need to evaluate levels of PM-10, an air pollutant targeted as a problem in these areas. The Arizona-Sonora subgroup will build on existing efforts to recommend and implement air quality improvement strategies, with the ultimate goal of meeting health-based ambient air quality standards. Particulate monitoring at base sites in ambos Nogales and Douglas-Agua Prieta will continue over the long-term.

- In the Yuma air basin, EPA and ADEQ will continue to implement reasonable available control measures as evaluated in the State Implementation Plan to attain PM-10 NAAQS and maintain the NAAQS through the year 2000.

- In light of the expansion of Nacozari smelter and imminent shutdown of the Cananea smelter, the Air Workgroup will assess the need to revise Annex IV of the La Paz Agreement.

Hazardous and Solid Waste

- SEMARNAP will facilitate projects that result in the construction and operation of environmentally responsible controlled landfills for hazardous and industrial waste to build waste management capacity.

- Proper management, treatment and disposal of hazardous and solid waste and compliance with regulations for transboundary shipments of hazardous waste will remain a priority for the Arizona-Sonora region. Continued cooperation among the state and local offices will focus on:
  - ongoing information and technology transfer;
  - cooperative training;
  - building laboratory sampling and analysis capabilities;
  - developing recyclables markets; and
  - using and improving HAZTRAKS as a tracking and compliance tool.

- One of the principal actions will be to improve waste management practices in the Arizona-Sonora region and promote solid and hazardous waste minimization and recycling. This will be accomplished by:
  - developing partnerships with industry to encourage waste minimization and safe material management
  - providing site-specific compliance and technical assistance on an as-needed basis; and
  - training government officials, community leaders, and industry on waste reduction and pollution prevention

Contingency Planning and Emergency Response

- Both governments will develop state and local capacity for contingency planning, as well as emergency response in the areas of Yuma-San Luis Rio Colorado, Nogales-Nogales, Naco-Naco, and Douglas-Agua Prieta. This will be accomplished through the Joint Response Team which involves federal, state and local agencies with responsibilities for dealing with environmental emergencies through implementation of the Joint Contingency Plan in these sister cities, the creation and promotion of CLAMs, the creation and equipment of

communication and emergency response centers, training of staff involved in emergency response, and communication with the public, among other activities.

Environmental Information

- Responsible authorities plan a concerted effort to characterize environmental conditions and trends and their potential links to health issues. Long-term air and water monitoring efforts are intended to be developed or improved. Coupling these efforts with soil sampling at regional areas of concern will foster the compilation of necessary data for multimedia analysis. This information will facilitate risk-based decision-making.

- Such environmental data gathering efforts will develop a comprehensive base of environmental information which will augment pollution prevention and control programs on both sides of the border and support environmental health assessments.

Pollution Prevention

- EPA will work with the cities of Nogales, Arizona, and Nogales, Sonora, to implement a pollution prevention program that will provide technical assistance to industry, institute a pollution prevention award program, and provide outreach and education to the public.

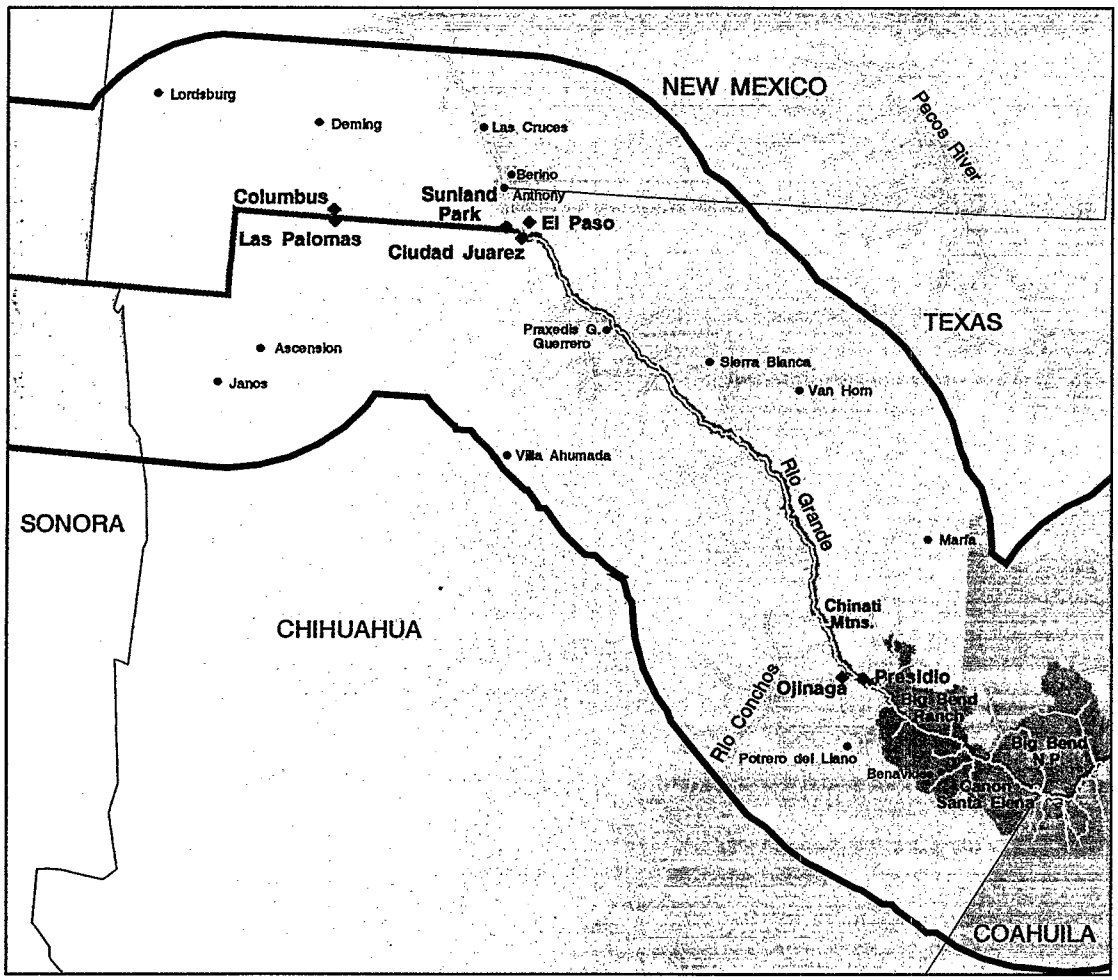
- The bilingual environmental education curriculum, being prepared for ambos Nogales school districts as part of the Ambos Nogales Wellhead Protection Program, will be shared with all of the school districts in the Arizona-Sonora region as the beginning of a larger effort to develop local environmental education resources. Public education efforts will continue to improve local and regional awareness about environmental issues and needs. The intention of pollution prevention and partnering in pollution prevention efforts throughout the Arizona-Sonora border region is to enhance small business technical assistance and technology transfer.

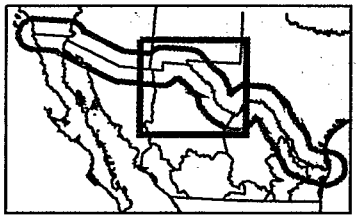
Cooperative Enforcement and Compliance

- The Cooperative Enforcement and Compliance Workgroup will promote the establishment of a subgroup for the Arizona-Sonora region, which will have the responsibility of meeting the objectives referred to in Chapter III.

- The PROFEPA inspection program estimates that it will carry out 2,600 inspections between 1996 and 2000 to monitor regulatory environmental compliance.

New Mexico-Texas-Chihuahua Region





- City
- Sister City
- State Boundary
- U.S./Mexico Border
- 100km Buffer
- Water Body
- Protected Area

CDSI
Map created by CDSI
September 25, 1996

N

100 0 Miles

Sources: Digital Chart of the World, TNRIS, National Parks Service, TXP&W

EPA Region 6
GIS Team
Dallas, Texas

CHAPTER VI

NEW MEXICO-TEXAS-CHIHUAHUA

In order to promote a regional approach to environmental problem solving, this chapter focuses on environmental issues and problems, past and ongoing projects, and objectives that are specific to the New Mexico-Texas-Chihuahua area of the border region. The borderwide objectives and ongoing activities described in Chapter III also pertain to the New Mexico-Texas-Chihuahua border region.

Brief Overview

The New Mexico-Texas-Chihuahua region stretches approximately 500 miles (800 km) along the international boundary from the Coronado National Forest to Big Bend National Park and includes the following major sister cities: Columbus-Palomas, Sunland Park-El Paso-Ciudad Juarez, and Presidio-Ojinaga.

The states of New Mexico, Texas, and Chihuahua come together in the area of Sunland Park, New Mexico, El Paso, Texas, and Ciudad Juarez, Chihuahua. This area is commonly known as Paso del Norte. Almost 2 million residents live in the urban and semiurban area, and it is projected that by the year 2010, there will be 3.5 million people living in Paso del Norte alone. This population forms an important part of the growing binational economy of the region.

In Ciudad Juarez, of the working population, nearly 50 percent work in the industrial manufacturing sector; 15 percent work in the service sector; and 5 percent work in agriculture, livestock, and fisheries.

TABLE 6.1
POPULATION

Population Center	1980 Population	1990 Population	1995 Population
Columbus, New Mexico	410	640	770
Palomas, Chihuahua	12,000	16,500	20,000
Sunland Park, New Mexico	4,300	8,200	9,100
El Paso, Texas	425,300	515,300	583,000
Ciudad Juarez, Chihuahua	567,000	850,000	1,010,000
Presidio, Texas	1,600	3,000	3,500
Ojinaga, Chihuahua	26,000	24,000	23,600
Total	1,036,610	1,417,640	1,649,970

Notes for Table 6.1 Population

- U.S. population figures for 1980 and 1990 come from the U.S. Census. The 1995 figures for cities in New Mexico are estimated from the USDOC, Bureau of Census, October 1995 estimates for July 1, 1994. El Paso, Texas estimate is from Texas State Data Center Estimates and Population Program prepared by Department of Rural Sociology, Texas Agricultural Experiment Station, Texas A&M University System, January 1, 1996 population estimate.
- Mexican population figures for 1980 and 1990 come from the X and XI INEGI National Census of Population and Housing. The 1995 data comes from the 1995 INEGI Count of Population and Housing.

This region is a part of the Chihuahuan Desert ecosystem that is primarily comprised of arid to semi-arid biotic communities. Characteristic vegetation is primarily shrubs which sometimes form low closed thickets. Short grass species grow in association with shrubs, such as creosote bush, yucca, gray thorn, along with various forbes, and cacti. Some isolated mountains in the Chihuahua Desert (Chisos and Guadalupe Mountains in the U.S. and Sierra Rica in Mexico) are high enough to sustain oak, juniper, and pine woodlands in the higher altitudes with unique ecological characteristics.

The Rio Grande, Pecos River, and Rio Conchos are the only perennial streams. These water bodies form an important riparian corridor for neotropical wildlife. As many as 80 species of native Chihuahuan Desert fishes are known to inhabit this unique, yet geographically vast, ecosystem. These aquatic habitats are subject to a wide variety of natural and artificial water stresses.

In both the U.S. and Mexico, numerous parks and reserves have been established to protect the Chihuahuan desert habitat. These include Big Bend National Park and the Big Bend Ranch Natural Area in the state of Texas, and the Cañon de Santa Elena Reserve recently established in Chihuahua for the protection of this ecosystem, as well as the Maderas del Carmen protected area in the state of Coahuila.

Environmental Issues and Problems

Natural Resources

Habitat alterations are the principal concern affecting biodiversity in the region. The illegal extraction of wild flora species such as cacti and the introduction of exotic species that alter natural habitats are ongoing problems in both countries. Illegal hunting, wildlife trafficking, overgrazing, and, in general, the overexploitation of resources are also important problems.

Increased human population along the border has increased the demand for wood and wood products while land availability for growing trees is decreasing. Forestry and soil conservation concerns include soil erosion control, loss of forest lands, threatened and endangered species protection and habitat management, including traditional uses among indigenous people. For this reason, erosion control and restoration and revegetation of areas is necessary, especially in those areas with high saline soil. Some native species previously used only for fuel wood are being extensively harvested for other consumptive uses including saw logs. Other wood products are valued and need to be developed more fully in Mexico for local sale or export. These consumptive uses threaten forest stand sustainability, but a balance must be reached between commercial use and conservation of the wood.

Genetic quality of species (i.e. Chihuahua pine and Douglas fir) have been reduced due to overcutting and selective removal of higher quality individual trees. Efforts aimed at improving the quality of the seed source, as well as the process for selecting seedlings for planting, are needed.

Water

The potential for overuse and pollution of groundwater and surface water are serious concerns and affect human health and natural resources along the Rio Grande including protected areas such as Big Bend National Park, Cañon de Santa Elena, and the Big Bend Ranch State Natural Area. The lack of sufficient in-stream flows in the Rio Grande to support riparian habitat and aquatic habitat may be a problem.

The public has identified drinking water quality and groundwater contamination as major concerns in this geographic area. Residents of New Mexico believe a large number of colonias in Doña Ana County have contaminated water supplies. Residents of Texas are worried about potential contamination of groundwater sources by the pipeline at Lakeside and by the proposed low level radioactive nuclear waste disposal site in Hudspeth County, Texas.

A pressing environmental issue in the El Paso-Ciudad Juarez region is the critical lack of water resources. Complicating the problem is the border setting, with two major urban centers, three states, and two nations sharing limited water resources in an arid region. The cities depend on the bolson deposits of both the Mesilla and Hueco aquifers as the major source of water for municipal and industrial use. The Hueco aquifer is a source of agricultural irrigation water. Due to the low rate of groundwater recharge, levels of fresh water in these formations have been declining. As pumping increases with population growth, the water resource will become saltier and its depletion will be accelerated. The solutions to this problem involve developing a better understanding of the groundwater system and implementing water conservation measures, wastewater reclamation and reuse.

In Ciudad Juarez, the current water supply is sufficient to meet the present population demand. However, given current supplies are being exhausted and problems posed by magnesium contamination, the bolson aquifer must be used as an additional source of water. To resolve this problem, construction of the Conejose-Medanos Aqueduct and employment of the waters of the Rio Grande as a drinking water source are contemplated. In Ojinaga, the current water supply is sufficient to meet present and future population demands.

Current sewage collection systems in both cities (Ciudad Juarez and Ojinaga) are sufficient to handle the projected wastewater volume until the year 2015. However, the effluent is not pretreated prior to discharge, causing groundwater pollution and soil saturation due to insufficient drainage. In Ciudad Juarez, the construction of treatment plants has been put out for bid; however, construction has not been initiated due to lack of resources. Nonetheless, the municipal board is carrying out a wastewater pretreatment and control program for industrial discharges to the municipal sewage system. Ojinaga has a stabilization pond which is not operational due to a blockage problem.

Through analysis of the region's water infrastructure needs, CNA found that 90 percent of the population receives quality drinking water, 75 percent of the residences are connected to a sewer

system, and there is no treatment for wastewater. At this time, CNA has estimated resource requirements to meet the region's present infrastructure deficiencies as shown in Table 6.2.

TABLE 6.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Drinking water	8.0	12.0	22.0	42.0
Sewer systems	7.0	2.0	5.0	14.0
Treatment	19.0	1.0		20.0
Institutional strengthening	3.0	2.0	1.0	6.0
Increased efficiency	4.0	1.0	3.0	8.0
Studies and projects	0.3	0.2		0.5
Total	41.3	18.2	31.0	90.5

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

Domestic water supply in the New Mexico and Texas colonias is a serious community concern. The lack of adequate wastewater treatment and improper hazardous and solid waste management are considered major contributors to the insufficient environmental conditions and the high risk to human health. These polluted conditions are most evident in agricultural drains within the boundaries of those colonias. The public expressed a need for a consolidated plan to introduce basic water supply and sewage services in the colonias. In New Mexico, the public is aware of the funds available for colonia improvements, but believes lack of coordination among the numerous agencies involved in the process interferes with the resolution of problems in their communities.

Many colonia developments are located on former agricultural lands within the service area of Bureau of Reclamation (BOR) projects, particularly in the Lower Valley of El Paso. Many colonia residents were sold land without the proper infrastructure, i.e., sanitary and potable water. Most residents of the colonias built their own dwellings and either haul their drinking water to their lots or drill shallow wells. Wastewater is typically handled onsite with cesspools or septic tanks and leach fields. Over time, the absence of adequate infrastructure may have resulted in the contamination of the groundwater from which the water supply is sometimes drawn.

Environmental Health

A diagnosis of environmental health should be carried out to prevent and eliminate diseases related to the environment, such as the high incidence of hepatitis A and tuberculosis in this region. Residents of colonias lacking safe drinking water or adequate sewage systems are predisposed to gastrointestinal diseases such as hepatitis A, salmonellosis, shigellosis, and amebiasis transmitted through contaminated food and water. The tuberculosis rate for Texas border counties, for example, remains more than twice the statewide rate emphasizing the importance of binational collaboration

to identify and treat patients along the border in order to reduce transmission. In addition, there is a potential for upper respiratory infections and other related lung diseases due to noncompliance with air quality standards.

Air

A serious consequence of accelerated growth in the region is sustained deterioration of the environment, particularly with regard to air quality. These air quality problems are due to excessive emissions from mobile sources (for example, automobiles and trucks), point sources (factories and diverse industrial operations) and area sources (internal combustion garden equipment, paint and other coatings). These pollution sources grow as population and economic activity increase.

Two areas in the border region of New Mexico and Texas do not meet all of the U.S. standards for air quality. Portions of El Paso County, Texas, do not meet the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM-10), carbon monoxide (CO), or ozone (O_3). In New Mexico, air quality in the city of Sunland Park in Doña Ana County does not meet the federal standard for ozone. Also in Doña Ana County, the city of Anthony contains a small area that does not meet the federal standard for PM-10.

Currently in Mexico, there is no guidance by which to determine "nonattainment" with Mexican air quality standards. Additionally, there is insufficient air quality monitoring data to determine if Mexican cities meet the Mexican air quality standards. Aside from these limitations, Ciudad Juarez potentially does not meet Mexican air quality standards for particulate, carbon monoxide, and ozone. This is based on existing monitoring results as well as a knowledge of emissions sources and their potential emissions.

To develop a cost-effective strategy to reduce air pollution, federal, state, and local authorities must have an accurate assessment of the current problems. With this in mind, communities in the El Paso-Ciudad Juarez-Sunland Park area indicated a critical need for more air monitoring within the binational air basins. This is seen as an essential first step in identifying air problems and working towards improvement of air quality in the region. Border residents are concerned that air quality problems in the region have important implications to their health.

Sustained industrial growth in the El Paso and Ciudad Juarez area has also given rise to concern about the air quality problems that can result from increased truck traffic. In the case of El Paso, Sunland Park, and Ciudad Juarez, the composition of cross-border traffic is compounded by long idling times at border crossing points. This is a visible indication of the threat to air quality in the downtown areas. The area will continue to have high volumes of cross border commercial traffic. Further, the growing concentration of maquiladora plants is an increasing air quality concern.

One "area source" that is of particular concern is solid waste burning, such as landfills or trash burning for a variety of reasons. This was identified as a concern by area residents as a potential source of hazardous air pollution or a contributor to general air quality problems. With regard to mobile sources, residents also called for more automobile emissions testing on both sides of the border to address the high volume of vehicle crossings. Enforcement of heavy vehicle transportation routes was put forth as a partial solution to congestion and pollution problems.

In addition to potential human health effects, there is concern that poor air quality in the El Paso-Ciudad Juarez-Sunland Park area may adversely affect the ecology of the San Andres National Wildlife Reserve. Air pollution appears to be one of the primary management issues facing this unique refuge. Air quality problems also continue to be a serious concern to the ecological integrity of other federal and state operated land. The ad-hoc binational workgroup formed to deal with air quality problems in the Big Bend National Park area formed a subgroup to devote some attention to air quality problems in the El Paso, Texas and Ciudad Juarez, Chihuahua areas. However, the workgroup as a whole is now primarily focused on air quality in the Big Bend region.[1]

A key component of the effort to improve air quality in this area has been locally based initiatives to advocate low-cost, locally implementable programs to reduce air pollution. As the process evolved, local residents urged the U.S. and Mexican federal governments to develop a formal method for local residents to guide and collaborate with government programs in the area. In response, the two governments negotiated an agreement which created a Joint Advisory Committee for Air Quality Improvement and defined the El Paso-Ciudad Juarez-Sunland Park area as an Air Quality Management Basin. The Committee will develop locally based binational initiatives for incorporation into the overall activities of the Workgroup.

Hazardous and Solid Waste

Residents of the region expressed significant concern about the types, quantities, and destinations of hazardous materials and wastes. Community and government concerns stem from the high number of crossings of the El Paso-Ciudad Juarez border and projections that commercial transportation across the international boundary will likely increase with the phase-in of NAFTA.

Sunland Park colonia residents feel their concerns over the types of materials deposited in the local landfill site are not receiving enough attention. They also expressed concern about the proximity of the landfill to their residential area. Community residents, as well as both governments, realize that landfill sites in the area require special attention because of the potential for runoff into the Rio Grande. A hazardous waste site, known as Sierra Blanca, has been proposed in Hudspeth County, Texas. The state of Texas is proceeding with public hearings on this project.

In March 1996, the Interministerial Group on Hazardous Waste Disposal Sites for the Mexico-U.S. Border was formed in Mexico with the purpose of issuing joint statements on hazardous waste facilities and developing programs for compliance and monitoring of existing sites. This group is composed of INE, PROFEPA, the Coordinating Office of International Affairs of SEMARNAP, the Secretariat of Energy, the National Commission for Nuclear Security and Safeguards (CONASENUSA) and SRE.

Contingency Planning and Emergency Response

As a result of industrialization and the high concentration of industries which use hazardous materials and generate wastes in their processes, large amounts of hazardous materials and wastes frequently pass through cities which are located near the international border crossings. These border cities lack

[1]For more information on this workgroup, see the Air section in Chapter VII.

the resources to buy and equip the emergency response units required to respond to chemical accidents. In addition, legal and insurance issues associated with the transboundary movement of equipment and personnel must be resolved.

Cooperative Enforcement and Compliance

Because of the growing concentration of population and industrial activity, compliance with environmental requirements is essential for health and welfare in the area. Local, state and federal agencies involved in enforcing environmental laws and promoting compliance can improve their effectiveness through cooperation.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NATURAL RESOURCES			
Santa Elena Canyon Project	1990-1995	NPS, INE, Chihuahua, UACH, INAH	UACH/INE baseline inventory of natural and cultural resources completed. Declared a reserve for protection of flora and fauna in 1995.
Environmental Education Program	Ongoing	NPS, PROFAUNA A.C. UACH, UTEP, Chihuahua	Design and presentation of special environmental education programs for school children on the U.S.-Mexico border.
Program for the Management of the Santa Elena Flora and Fauna Protected Area	1995	INE, UACH	Preliminary version of management program is developed, and will be presented for consideration and agreement with local citizens and authorities for the final version.
Biological diversity of the northern Mexican prairies	Ongoing	INE, CES, UNAM	Conduct a biological inventory of the vertebrates and flora of the northeast prairies of Chihuahua, based on information from relevant literature, scientific collections, and field work.
Conservation education and community outreach in Cañon de Santa Elena Wildlife Refuge	1995	FWS, NPS, INE	Develop conservation education opportunities to communities in the Cañon de Santa Elena Reserve.
Distribution of the wild turkey habitats and genetics	1994	INE, FWS, UACH, CES	Conduct an ecological and genetic study of the wild turkey for its management and conservation in the northern border area of Mexico.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Conservation of the masked quail	1994	INE, FWS, UACH	Organize a conservation program for the masked quail in Chihuahua.
Evaluation of the gray crane in Chihuahua	1993	SEDESOL, FWS, UACH	Understand the population structure of the gray crane in the state of Chihuahua to establish conservation programs.
Yaqui catfish and Yaqui sucker collection: Rio Bavispe in Chihuahua and Sonora	Ongoing	FWS, INE, AGFD	Baseline surveys and population studies of Yaqui sucker and Yaqui catfish in the Rio Bavispe, Mexico.
Biodiversity conservation in the Rio Grande, New Mexico and Texas	1995-1996	FWS	Resource protection involving habitat conservation planning, coordination of federal projects and recovery of endangered species.
Aplomado falcon habitat characteristics	1996	Autonomous University of Chapingo, BRD, FWS	Gain understanding of the ecological characteristics of the Aplomado falcon in order to establish conservation programs.
Advance study seminar on Mexico values	1993-1995	NPS	Yearly educational seminars.
Improvement of forest genetics of threatened and endangered tree species	Ongoing	USFS-Northeast Station, INIFAP, SEMARNAP-Chihuahua, Canada	Improve seed quality of pine species, such as Chihuahua pine and Chihuahua fir.
Improvement of threatened and endangered tree species by genetics	1993 - Ongoing	USFS, SERMARNAP - Chihuahua, INIFAP-N. Region, Canadian Forestry	Through research and training, seed quality, selection process, and silviculture practices related to tree selection have improved.
Sustainable use of forest practices	1993 - Ongoing	USFS, SEMARNAP, INIFAP-N. Region, Ejido Basaseachic	Best Management Practices (BMP) guidebook has been developed, BMP demonstration site established.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
El Largo-Madera Ecosystem Management Practice	1993 - Ongoing	Ejido Largo-Madero, INIFAP N.-Region, USFS-RMRS, SEMARNAP	Developed ecosystem management plan for production of various wood and non-wood products with community participation.
WATER			
Constructed Wetlands Wastewater Treatment Model Project	1993 - Ongoing	EPA, NMED, Mesquite, N.M.	Construction of a model constructed wetlands to address wastewater treatment is currently underway in the colonia of Mesquite, New Mexico.
Circuit rider for technical assistance for public water systems along U.S.-Mexico border	1994- Ongoing	EPA, TNRCC	The objective of this program is to help utilities along the border to comply with state and federal regulations in a cost-effective manner. It also helps to ensure that water and wastewater utility services are maintained and expanded, where possible, by identifying financial resources and helping utilities access these resources.
Colonias Wastewater Treatment Assistance Program (CWTAP)	1993- Ongoing	EPA, TWDB	Grants are provided to local governments and nonprofit water supply corporations for design and construction of wastewater collection and treatment facilities. The program is administered by TWDB.
Rio Grande Toxics Baseline Study	1992-1993	EPA, IBWC, DOI, TNRCC, TDH, TPWD	Binational report completed in September 1994. While the study did not indicate that toxic contamination was widespread, several areas with elevated levels of toxic contamination were found, primarily below sister cities and in tributaries.
Technical assistance for small community drinking water systems in the New Mexico-Mexico border area	1994- Ongoing	EPA, UNM	Provides technical assistance on organizational structure and finance of small water supply systems along the border.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
El Paso City/County wellhead protection demonstration	1993	EPA, EPCCHED, TNRCC	This project implemented the city of El Paso's groundwater protection program throughout El Paso County with special emphasis on the area's colonias.
Las Cruces wellhead protection demonstration	1993	EPA, Las Cruces	This project demonstrated the feasibility of using county SIC codes in the process of conducting a contaminant source inventory for the public water supply wells of Las Cruces. Thirty-eight public water supply wells participated in the program.
Study of barriers to colonias infrastructure	1993-1994	EPA, International City/County Mgmt. Association (ICCMA)	A report on identifying barriers to achieving local government interest in colonias sanitation problems has been published.
Colonia Plumbing Loan Program (CPLP) in Texas	1991-Ongoing	EPA, TWDB	Loans are made available to low income colonia residents in designated border counties for residential plumbing improvements. Funds are administered at the local level.
Economically Distressed Areas Program (EDAP)	1989-Ongoing	TWDB	
Colonias Wastewater Construction Grants Program (CWCGP)	1993-Ongoing	EPA, NMED	Funds are provided for planning, design and construction of wastewater infrastructure to eligible New Mexico colonias. Currently there are 12 projects underway at different stages from planning through construction. This program is administered by NMED.
Colonias Assistance and Management Support Program (CAMSP)	1994-Ongoing	EPA, TWDB, El Paso Water Utilities Public Service Board	This program provides overall management and coordination to eligible colonias in order to submit an application for financial assistance to implement needed drinking water and wastewater facilities improvements.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Characterize transboundary aquifers - El Paso-Ciudad Juarez	1994-1996	EPA, IBWC, TWDB, NMSU	This study included reviewing existing literature and water quality information to identify gaps where additional information is needed to characterize the area's shared groundwater resources, focusing on the chemical and physical characteristics of the aquifers. The final report is due June 1996.
Municipal Onsite Wastewater Assistance Program	1994-Ongoing	EPA, TWDB	Small communities have been helped with an onsite technical assistance program for small community wastewater treatment plant operators developed by the TWDB.
Binational wastewater operator training	1995-Ongoing	EPA, Water Environment Fed. (WEF)	The first training session for wastewater treatment plant operators along the border has been conducted in a binational forum.
Binational water supply operator training	1995-Ongoing	EPA, American Water Works Association	The first training session on the requirements of the Safe Drinking Water Act has been conducted in a binational forum.
Rio Grande Toxics Study- follow-up	1995-Ongoing	EPA, IBWC, TNRCC	Field work completed. Report will help identify areas where additional water pollution control is needed.
Rio Grande-Rio Bravo Alliance	1995-Ongoing	Stakeholders thoughout the Rio Grande Basin, including EPA, TNRCC, Mexico, New Mexico and Colorado state and federal environmental entities, tribal representation, nongovernmental organizations, and other local stakeholder participation	The Rio Grande Alliance had its first coordinating meeting on July 15-16, 1996 in El Paso, Texas. This meeting included participants from throughout the Rio Grande Basin, including Mexico, New Mexico, Colorado, and tribal representation.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Rio Grande cities facilities planning	1995-Ongoing	EPA, IBWC	U.S.IBWC has procured A/E firms to develop planning of wastewater facilities to control wastewater discharges from Mexico into the Rio Grande.
Hueco Bolson Groundwater Model	1995-1999	USGS, El Paso Water Utilities	Developing necessary GIS of available data and landforms. Project ongoing.
Rio Grande-Rio Bravo NASQAN	Ongoing	USGS	Long-term databases of water quality, sediment and discharge.
Upper Rio Grande Basin NASQAN	1991-1997 Ongoing	USGS	Provide consistent description of water quality conditions, define trends and sound scientific understanding of factors affecting water quality.
Sewer system in Ojinaga	1990-1994	JMAS	The sewer system was rehabilitated and expanded.
Doña Ana County wastewater improvements	1995-Ongoing	EPA, NMED, Doña Ana County	Funds have been provided for planning, design and construction of wastewater improvements in Doña Ana County, New Mexico. Project is currently in the planning stage.
AmeriCorps groundwater protection	1994-1996	EPA, UTEP, TNRCC, Corp. for Nat. & Comm. Service	The objective of this project is to inventory and provide recommendations of controls for existing and potential sources of groundwater contamination located around the public water supply wells for the city and county of El Paso. The inventory of contaminant sources has been completed; the focus is turning to groundwater protection in colonias in the area.
New Mexico colonias enforcement action	1995-Ongoing	EPA, New Mexico Attorney General	This program supports the New Mexico Attorney General in the enforcement of state laws relating to colonia development.
Texas Colonias Enforcement Strike Force	1994-Ongoing	EPA, Texas Attorney General	This program supports the Texas Attorney General in the enforcement of state laws relating to colonia developments.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Aquifer storage and recovery study - Hueco Bolson	1995	BOR	
Mesilla Basin (TX-NM) groundwater monitoring	Ongoing	USGS	Data collection in process.
Rio Grande-Rio Bravo Basin international water resources assessment	1996-1999	BOR	
Ciudad Juarez-El Paso Wellhead Protection/ Groundwater Pilot Project	1994-Ongoing	EPA, TNRCC	Onsite assistance is provided leading to development and implementation of wellhead protection programs. The following communities now have wellhead protection programs: Fort Davis, Fort Hancock, Marathon, Marfa, Van.
Investigation of nonpoint source impacts to the agricultural drains in the colonias in El Paso County		TNRCC	
ENVIRONMENTAL HEALTH			
ATSDR Health Consultation	1994-1996	TDH, NMDOH, NMED, ATSDR	Health consultation to determine health impacts of ASARCO and Nu-Mex landfill on Sunland Park, N.M. residents.
Environmental Health Assessment	1995-1996	UT Houston School of Public Health, NMDOH	Environmental health assessment for Sunland Park, New Mexico.
Water quality monitoring of private drinking water wells	1995-1996	NMDOH	Monitoring of private drinking water wells for viruses, heavy metals, VOCs, and pesticides.
Environmental Health GIS	1995-1996	NMED, NMDOH	Develop GIS coverage of water quality and health status for New Mexico/Mexico border area.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Hepatitis A surveillance	1995-1996	TDH, BHO; Epidemiology Div.	Surveillance and study of hepatitis A in Chaparral, New Mexico.
El Paso Multiple Sclerosis Cluster	Ongoing	TDH	Preliminary confirmation of possible cluster. Preliminary review of available environmental data. In the process of writing grant proposal for funding. Working to find members of cohort.
Survey of health and environmental conditions in selected colonias in El Paso County, Texas	1994	TDH, University of Texas, Houston School of Public Health at El Paso	Preliminary border environmental health survey of 269 households in four El Paso county colonias which lacked piped drinking water. Results show risk of waterborne disease transmission persists; adequate wastewater disposal is lacking; children experienced relatively high levels of diarrhea; hygienic behaviors need to be improved; solid waste disposal also needs to be addressed.
Proyecto Juntos (Texas-Chihuahua)	1995-Present	TDH, EPCCHD, PAHO, SSA	Open lines of communication at the state level. Provisions for confidentiality and joint presentation of data.
Proyecto Juntos (El Paso-Ciudad Juarez)	1990-Present	TDH, EPCCHD, PAHO/USMBHA, SSA	First binational TB project. Improve communications and bidirectional referral. Increase lab capacity and supervised therapy for TB in Ciudad Juarez.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Presidio Community and Environmental Health Assessment	1995	TDH, University of Texas - Houston, School of Public Health at El Paso	A comprehensive survey of 316 households in the city of Presidio, including demographic information, health assessments related to chronic diseases, immunizations, health education on AIDS, TB and hepatitis A, nutrition, diabetes, water and food sanitation. Other aspects included access to health care, environmental block survey, waste and water sanitation, rabies control, and exposure to other environmental risk factors. Data analysis will be completed by July 1996.
Birth Defects Registry	Pilot began 1994 in TDH Regions 6 & 11. Expand to Regions 2, 3, & 5, South 8-10 in 1997.	TDH, March of Dimes, CDC	Pilot Birth Defects Registry (BDR), expansion, FBDR, statewide cluster investigation, referral information services (departmental case management), folic acid prevention/assessment, establishment and coordination of scientific advisory committee on birth defects in Texas.
Texas Small Towns Environment Program (STEP)	1994-Present	TDH, TNRCC, Texas Dept of Housing & Community Affairs, TGLO, TWDB	Interagency project to assist small communities to meet their water and wastewater needs through self-help/sweat-equity. Interagency workgroup. Initial thrust is in colonias along the Texas-Mexico border. Four current border projects: one in construction, three in various stages of design/planning/assessment. Newsletter.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NTD Field Surveillance Interventions, and Case-Control Study	1995-1996	TDH, CDC, EPA	Three years of surveillance data are complete. More than 60 percent of high risk women are taking folic acid. Case-control study for risk factors for NTD occurrence has been implemented.
Border Cancer Registry	Ongoing	TDH, CDC	Completed cancer incidence data collection and analyses for 18 border counties for 1990-1992. Continuing to collect incidence data for 1993 and forward. Report is being published.
Border Environmental Health Survey	1996-1997	TDH, EPA, CDC	About 2,100 household surveys will be conducted along the Texas-Mexico border to collect data on household structure, general sanitation, health conditions, and potential sources of exposure to environmental contaminants.
Binational Manager and Tracking and Referral System	1995-Present	TDH, EPCCHD Migrant Clinicians' Network	Under development. Toll-free access to TB information. from anywhere in Mexico or the U.S.
Mercury poisoning prevention	1995-Present	TDH, Amistad Binational Council, USMBHA	Completed investigation. Presentation made to Mexican physicians.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
AIR			
Ciudad Juarez-El Paso-Sunland Park Programs	Ongoing	SEMARNAP, EPA, TNRCC, State of Chihuahua, NMED, Ciudad Juarez, INE, El Paso, EDI	- Operation of ambient air monitoring network for CO, NO_x, SO_2, PM-10, lead, ozone (18 sites in El Paso County, 5 manual and 3 automatic in Ciudad Juárez). - Hot spot monitoring. - LIDAR field study - determine highest PM-10 concentrations to help establish permanent sites and field study sites. - Emission inventory complete in El Paso. Mexico has developed an inventory of 135 industrial sources for Ciudad Juárez. - Collection of upper air wind speed and direction data for air modeling - purposes. - Assessment of vehicle "smog check" programs. - Collection of ozone precursor and air toxics data. - Identification of innovative emissions controls. - Completion of negotiations with Mexico to create the Air Quality Improvement Committee for the El Paso/Juárez/Sunland Park Air Quality Basin. - The first course on emmissions inventories was completed in Ciudad Juarez.
Ciudad Juarez, El Paso, Sunland Park Air Quality Management Basin (AQMB) and Joint Advisory Committee (JAC) for Air Quality Improvement	Ongoing	EPA, INE, Texas, New Mexico, El Paso, Sunland Park, Chihuahua, Ciudad Juarez, EDF, DOS	Through the binational negotiations, the two governments have agreed on a mechanism to incorporate direct local input to improve air quality through the development of air pollution abatement strategies.
El Paso County Hot-Spot Monitoring	Complete	EPA, TNRCC	

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Assessment of vehicle smog-check programs	Ongoing	EPA, INE, UAM, UTA, border state and local	
Intensive Summer Ozone Study Emissions Inventory Project Development of consistent industrial, area, and mobile source inventories for large urban centers of Mexico	Ongoing	INE, PROFEPA, PEA, WGA, Border States	Developed implementation plan for emissions inventory methodology. Prepared training course materials and emissions inventory development manuals. Identified technical studies including special studies and refinement of emissions inventory methods testing, validation of emissions estimates, emissions factor applicability to Mexico, and uncertainty analysis.
Intensive Summer Ozone Study Collection of ozone, ozone precursor, meteorological, and air toxics data for air modeling purposes.	Summer 1996, in progress	INE, EPA, IMP, LANL, Chihuahua, Texas, New Mexico, El Paso, Ciudad Juarez, SCERP	Results expected in mid-1997.
Intensive Summer Ozone Study LIDAR devices to detect upper air wind dynamics	Ongoing, Summer 1996	LANL, INE	Results expected in summer of 1997.
LIDAR Field Study Determine highest concentrations of PM-10 to help determine adequate monitoring sites and field study monitoring sites	Under Negotiation	LANL, INE, Ciudad Juarez	

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
HAZARDOUS and SOLID WASTE COOPERATIVE ENFORCEMENT and COMPLIANCE **(Please see Appendix 10 for additional solid and hazardous waste projects of U.S., state and local agencies)**			
Outreach and training to maquiladoras on regulatory requirements for transborder shipments of hazardous waste	1988-1993	EPA, SEDESOL, TNRCC, NMED, US and Mexican Customs, DOT, National Maquiladora Association, SCT, Cal-EPA, ADEQ	Six border wide conferences were held to increase understanding by maquiladoras and U.S. parent companies of import/export regulations. Developed bilingual manual for the maquiladora industry.
Collection equipment for municipal solid wastes; construction of two transfer stations; construction of two new cells in the sanitary landfill; improve access to the landfill; identify other needs (Juarez)	1993-1995	B.M., SEDESOL, state and city governments	Improve collection of solid wastes; continue appropriate solid waste disposal and improve control of contaminants, such as leaching and biogas; identification of infrastructure needs.
Enforcement Subgroup	Ongoing	EPA, PROFEPA, U.S. and Mexican Customs, U.S. DOT, SCT, TDPS, TNRCC, NMED	Multiagency involvement in environmental enforcement addresses enforcement issues which affect the geographic area (El Paso and Ciudad Juarez).
Education and training	Ongoing	EPA, TNRCC	Pursuant to an EPA grant, TNRCC provides training to address transboundary hazardous waste issues. TNRCC also established an information program and hot line for the public.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Enforcement of hazardous waste regulations using manifests and associated shipment data from HAZTRAKS, a binational computerized tracking system, to identify potential violators	Ongoing	EPA, TNRCC	A number of enforcement actions have been filed (administrative and judicial).
Inspection and investigations of hazardous waste transporters at key border crossings (e.g., weigh stations, transporter yards, waste warehouses) to find illegal shipments	1993-Present	EPA, PROFEPA, TNRCC, NMED, U.S. and Mexican Customs, U.S. DOT, TDPS, TDH	Pursuant to an EPA grant, monitor the import/export of hazardous wastes through a cooperative multiagency initiative to determine if shipments conform to applicable laws and regulations.
Hazardous waste enforcement	1995	TNRCC	Pursuant to an EPA grant, conducted 115 inspections of facilities, primarily in El Paso, which handle hazardous wastes imported from Mexico.
International bridge exercises	Ongoing	EPA, PROFEPA, TNRCC, U.S. DOT, U.S. and Mexican Customs	Two joint international bridge exercises were conducted in El Paso to examine binational procedures and requirements for transboundary movement of hazardous wastes.
U.S. Customs training courses	Ongoing	EPA, TNRCC, U.S. and Mexican Customs	Pursuant to an EPA grant, TNRCC conducted 12 Customs training courses on regulations pertaining to transboundary movement of hazardous wastes.
Transboundary enforcement	Ongoing	EPA, TNRCC	EPA funded two TNRCC positions in El Paso to enforce regulatory requirements pertaining to transboundary movement of hazardous wastes.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
International bridge inspections	Ongoing	TNRCC	Pursuant to an EPA grant, conducted 18 international bridge inspections on transboundary movement of hazardous wastes.
EPA-PROFEPA cooperation	March 1996	EPA, PROFEPA	Pursuant to PROFEPA request, EPA sent letters to U.S. parent corporations of maquiladoras encouraging compliance with Mexican laws.
CFC training	March 1996	EPA, U.S. Customs	EPA presented a course to U.S. Customs on CFC import/export requirements.
Transporter training course	Ongoing	PROFEPA, SCT, TNRCC	SCT conducted hazardous waste training courses at Mexican facilities.
U.S. Customs inspections	1995	EPA, U.S. and Mexican Customs, TNRCC	Pursuant to an EPA grant, TNRCC conducted two inspections of hazardous waste shipments on international bridges.
Inventory of solid waste landfills	Ongoing	EPA, TNRCC	Pursuant to EPA grants, an inventory of active solid waste landfills along the border was conducted. Training on landfill design, operation and closure was provided to Mexican officials and landfill owner/operators.
Assessment of illegal dumps	Ongoing	EPA, TNRCC	TNRCC is evaluating the scope of illegal dump problems and assessing collection/disposal needs.
POLLUTION PREVENTION			
Video conference on permanent pollution prevention program (P4) broadcast through Monterrey Institute of Technology	1995-Ongoing	TNRCC, ITESM	A four-hour video broadcast was downlinked at eight Mexican cities through the Monterrey Institute of Technology. Plans are developing for an extension of this P4 to downlink to 26 satellite campuses throughout Mexico to reach the maquiladora industries.

TABLE 6.3
PAST AND ONGOING PROJECTS - NEW MEXICO-TEXAS-CHIHUAHUA

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Technology transfer and capacity building on pollution prevention with PROFEPA	1995-Ongoing	EPA, TNRCC , PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, and Nuevo Leon	Joint partners site assessments and follow-up site visits are focussed on determining opportunities to implement pollution prevention and clean technology for Mexican industrial facilities. These have resulted in reductions in wastes and air emissions and have also cumulatively saved facilities over a million dollars through pollution prevention.
Pollution prevention assistance to small business operations	1996	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, and Nuevo Leon; EDF	Demonstration of a model spray booth for training operators in the auto and paint shop industry. Operators in the El Paso-Ciudad Juarez communities are taught to use low VOC paint spray systems and solvent recovery and recycling machines.
Technical assistance to Mexican state environmental agencies	1995-Ongoing	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, and Nuevo Leon	Continue capacity building with Mexican state and federal environmental agencies by providing training and technical assistance in the four Mexican states bordering Texas.
Solid waste recycling initiatives	1995-Ongoing	EPA	Solid waste and recycling conferences. Conferences were held April 1995; October 1995; February 1996; and the latest in Nuevo Laredo on May 22-23, 1996.

Objectives for the Next Five Years

Natural Resources

- Protect, recover, and manage species in danger of extinction in the New Mexico-Texas-Chihuahua border region including the black bear, the peregrine falcon and the beaver, among others.

- Implement management plans, educational opportunities and conservation projects in the following protected areas: Santa Elena Canyon Flora and Fauna Protected Area, Big Bend National Park, and the Big Bend Ranch National Area.

- Conduct biological inventories, coordinated by INE and CONABIO, in the Santa Elena Canyon Flora and Fauna Protected Area.

- Establish the organizational structure and joint inspection committees in the Santa Elena Canyon Flora and Fauna Protection Area. Design strategies for the long-term financial self-sufficiency of this protected area. Promote projects and activities that offer an economically viable alternative which supports sustainable development for the residents that live in or around this area.

- Jointly develop a "best management practices" plan in the area of forestry. Carry out environmental impact assessments to determine the effects of human activities on the soils and vegetation. Strengthen collaboration in the sustainable management of forests through training and exchange of personnel. Also, continue collaboration between the two countries for the prevention of forest fires.

- Increase reforestation efforts, including nursery management, to improve the quality and quantity of seedling survival in plantations as well as natural forests. Expand genetic and silvicultural activities to recover and manage threatened and endangered plant species.

- Pursue opportunities for collaboration in developing windbreaks around agricultural lands, as a soil conservation method, as well as the development of commercial plantations for wood products and nonwood products (i.e., jojoba, Christmas trees, etc.).

- Establish a rural aquaculture program to train local residents in how to manage aquaculture activities with available resources. Incorporate aquaculture as a productive activity, with a low environmental impact, that represents benefits to the local populations and contributes to the conservation of endemic aquatic species or species in danger of extinction.

Water

- In the U.S., water and wastewater infrastructure in the colonias and small communities are the highest priority. In Mexico, water infrastructure in the municipal areas is the highest priority; however, a need also exists in the small communities. Specifically for this area, new/renovated wastewater treatment facilities are needed in Ciudad Juarez. In conjunction with any wastewater treatment systems that are constructed, an industrial wastewater pretreatment program to control industrial discharges to sewer systems and water bodies will be needed. The U.S. and Mexico will continue to work with the appropriate organizations to assist these communities in developing facility plans and obtaining funds to address these needs.

- Pending available resources, establish binational priorities and develop a long-term joint program, through DOI, EPA, IBWC, and SEMARNAP, in cooperation with state and local authorities, to systematically map and characterize Mimbres Basin at Columbus-Palomasand the Rio Grande-Rio Bravo in the El Paso-Ciudad Juarez area for surface and groundwater.

- The TNRCC and EPA will continue to share information with CNA and other appropriate Mexican authorities regarding the creation of the Rio Grande Alliance. The U.S. and Mexico will continue to work with different state and federal agencies to manage their ecosystem and watershed activities. Comprehensive planning for the Rio Grande watershed will help both governments develop solutions to identified water quality problems. Similar collaborative efforts will be encouraged along of the rest of the border.

- A continuing effort in surveillance, monitoring, and data acquisition will be undertaken to determine the status of surface and groundwater resources in the Rio Grande Watershed. The United States-Mexico technical subgroup will continue the process of data exchange and the development of regional hydrogeologic studies for El Paso-Ciudad Juarez groundwater.

- The U.S. and Mexico will continue to work together to complete the ongoing Rio Grande water quality studies, begin analysis of the data, and evaluate the need for additional monitoring.

- Inherent in the efforts to protect surface and groundwater resources is the need to improve urban infrastructure associated with the supply of drinking water and the disposal of wastewater. Recognizing the importance of the Rio Grande in terms of sustainable development, the U.S. and Mexico will work together on a watershed-based analysis of drinking water and wastewater infrastructure needs for the cities, towns, and communities near the river. EPA and CNA will continue to work with the IBWC and BECC to facilitate the development of the Rio Grande Cities Facilities Planning projects.

Environmental Health

- In-depth discussion of binational, geographic-specific five-year objectives has only commenced in earnest with the issuance of the Framework Document. The intent is to translate the overall environmental health objectives outlined in Chapter III into objectives, priorities, and projects specific for this region benefiting from further binational discussions and the input obtained from community outreach meetings.

Air

- EPA and SEMARNAP will continue close collaboration to develop the technical information upon which to base a comprehensive air quality control program that will bring the region into compliance with appropriate domestic federal standards. This means each country will be

developing detailed emission inventories of affected areas to first determine the amount and composition of air pollution.

- Concurrently, each country plans to increase the volume and quality of air quality data through the integration of the air monitoring network. Based on data gathered during intensive study, and analyzing data obtained during routine monitoring, the countries will turn to developing a pollution control program, measuring the long-term improvement in air quality, and continuing the exchange of technical information.

- Under the auspices of Annex V of the La Paz Agreement, additional intensive field study may be undertaken to provide the information necessary to develop a binational air quality improvement plan.

- As stated in the "Environmental Issues and Problems" section of this chapter, bilateral agreement was reached to establish a Joint Advisory Committee for the Improvement of Air Quality which will recommend strategies for the prevention and control of air pollution in the Paso del Norte Air Basin. The twenty-member Committee (ten from each country) will include governmental representatives and will draw at least half of its members from local nongovernmental sectors. These local participants will include representatives from El Paso, Texas, Doña Ana County, New Mexico, and Ciudad Juarez, Chihuahua, and representatives from business, academia, and environmental organizations. The Committee will provide a unique mechanism for facilitating a "bottom-up" cooperative approach to addressing local air quality issues.

Hazardous and Solid Waste

- Proper management, treatment, and disposal of hazardous and solid wastes, as well as compliance with regulations for transboundary shipments of hazardous wastes, will remain a priority for the New Mexico-Texas-Chihuahua region. Continued cooperation among the state and local offices will focus on:
  - ongoing information and technology transfer;
  - cooperative training;
  - building laboratory sampling and analysis capabilities;
  - developing recyclables markets; and
  - using and improving HAZTRAKS as a tracking and compliance tool.

- One of the principal actions will be to improve waste management practices in the New Mexico-Texas-Chihuahua region and promote solid and hazardous waste minimization and recycling. This will be accomplished by:
  - Developing partnerships with industry to encourage waste minimization and safe material management;
  - Providing site-specific compliance and technical assistance on an as-needed basis; and
  - Training government officials, community leaders, and industry on waste reduction and pollution prevention.

Contingency Planning and Emergency Response

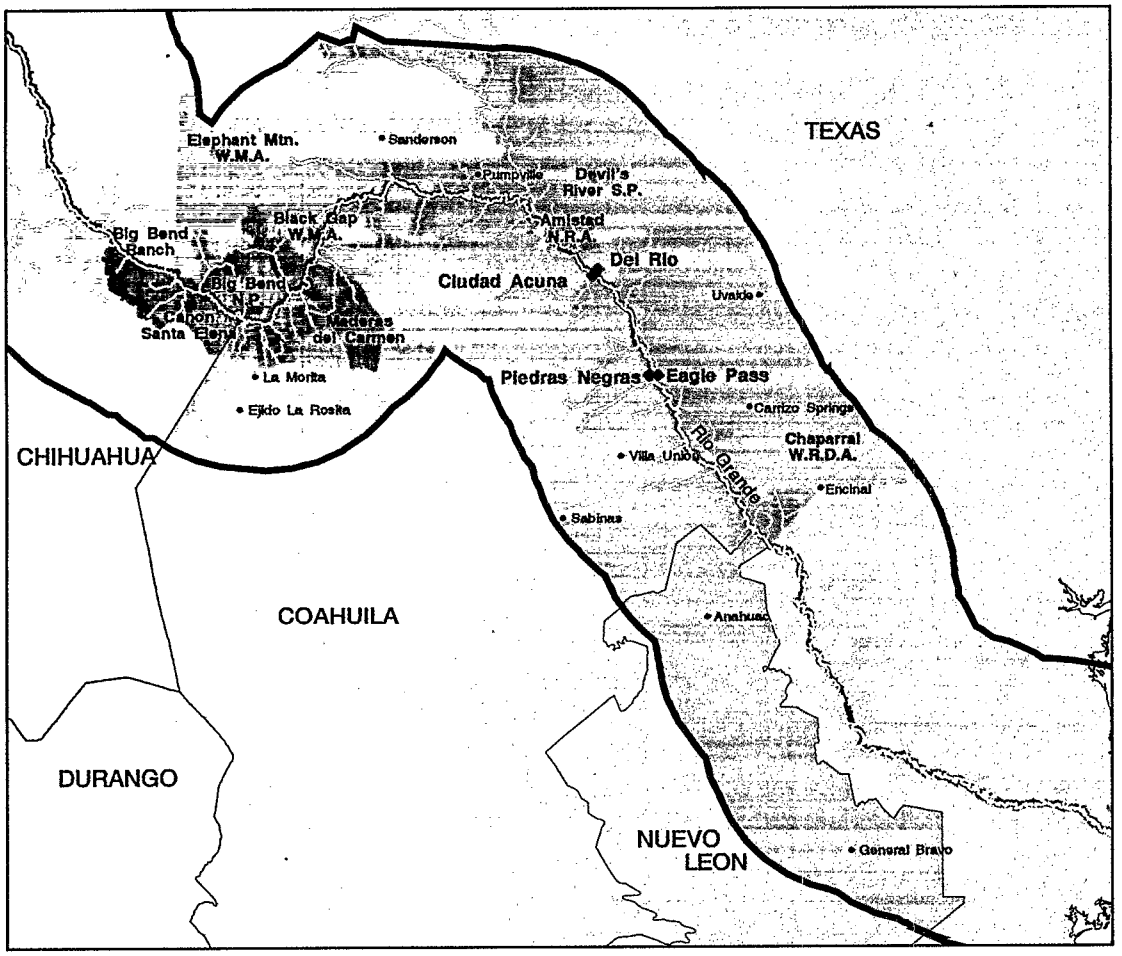
- Both governments will develop state and local capacity for contingency planning, as well as emergency response in the areas of Columbus-Palomas, El Paso-Ciudad Juarez, and Presidio-Ojinaga. This will be accomplished through the Joint Response Team which involves federal, state and local agencies with responsibilities for dealing with environmental emergencies through implementation of the Joint Contingency Plan in these sister cities, the creation and promotion of CLAMs, the creation and equipment of communication and emergency response centers, training of staff involved in emergency response, and communication with the public, among other activities.

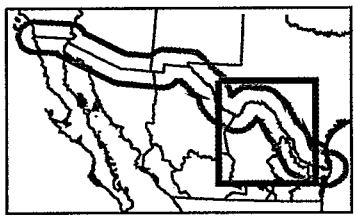
Cooperative Enforcement and Compliance

- The Texas-Chihuahua Cooperative Enforcement Subgroup, with the close collaboration of EPA and PROFEPA, will promote interagency and binational cooperation among all relevant local, state and federal authorities involved in environmental enforcement. Such cooperation will seek to enhance effective enforcement and promote compliance with environmental laws, consistent with the objectives of the Cooperative Enforcement Workgroup outlined in Chapter III. The subgroup will develop annual action plans for implementing cooperative projects. The independent enforcement and compliance activities of the various authorities will be coordinated with these efforts.

- The PROFEPA inspection program expects to carry out 2,600 inspections between 1996 and 2000 to monitor regulatory environmental compliance in the state of Chihuahua.

Texas-Coahuila-Nuevo Leon Region





- City
- Sister City
- State Boundary
- U.S./Mexico Border
- 100km Buffer
- Water Body
- Protected Area

CDSI Computer Data Systems, Inc.
Map created by CDSI
September 25, 1996

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100 0 Miles

Sources: Digital Chart of the World, TNRIS, National Parks Service, TXP&W

EPA Region 6
GIS Team
Dallas, Texas

CHAPTER VII

TEXAS-COAHUILA-NUEVO LEON

In order to promote a regional approach to environmental problem solving, this chapter focuses on environmental issues and problems, past and ongoing projects, and objectives that are specific to the Texas-Coahuila-Nuevo Leon area of the border region. The borderwide objectives and ongoing activities described in Chapter III also pertain to the Texas-Coahuila-Nuevo Leon border region.

Brief Overview

Eagle Pass and Del Rio in Texas, and Piedras Negras and Ciudad Acuña in Coahuila are in the central portion of the border between Texas and Mexico. Table 7.1 contains some general population figures for these cities.

TABLE 7.1
POPULATION

Population	1980 Population	1990 Population	1995 Population
Del Rio, Texas	30,000	30,700	34,400
Ciudad Acuña, Coahuila	42,000	56,800	81,600
Eagle Pass, Texas	21,400	20,650	24,800
Piedras Negras, Coahuila	80,300	98,200	116,000
Anahuac, Nuevo Leon	Not Available	17,300	18,300
Total	173,700	223,650	275,100

- U.S. population figures for 1980 and 1990 come from the U.S. Census; 1995 estimates are from the Texas State Data Center Estimates and Population Program prepared by Department of Rural Sociology, Texas Agricultural Experiment Station, Texas A&M University System, January 1, 1996 population estimate.
- Mexican population figures for 1980 and 1990 come from the X and XI INEGI Census. For 1995, the data was obtained from the 1995 INEGI Count of Population and Housing.

In this area, the Chihuahuan Desert consists primarily of arid to semiarid biotic communities. Short grass species grow together with shrubs, such as creosote bush and yucca, as well as various forbes and cacti, which usually grow in open stands but sometimes form low closed thickets.

The Rio Grande is the largest perennial river in the area. It forms an important riparian corridor for neotropical wildlife and is an important source of water for urban, agricultural, and light industrial needs of the region. As many as 80 native Chihuahuan Desert fish are known to inhabit this unique

and vast aquatic ecosystem. The Falcon and Amistad Reservoirs are important for water storage, conveyance, recreation, and the conservation of wildlife.

In both the U.S. and Mexico, numerous parks and reserves have been established to protect the Chihuahuan desert habitat. These include Big Bend National Park and the Big Bend Ranch Natural Area in the state of Texas, and the Cañon de Santa Elena Reserve recently established in Chihuahua for the protection of this ecosystem, as well as the Maderas del Carmen protected area in the state of Coahuila.

The Maderas del Carmen region in the northeast of Chihuahua is a relatively isolated zone. It contains ecosystems representative of the Chihuahuan Desert, all of which have a large diversity of flora and wildlife species, with vegetation such as desert shrubs, grasslands, oak forests, pine-fir forests, and riparian vegetation.

The area's composition, altitude, and continuity make it an important biological corridor because of its dispersion of plants and animals, as well as a migratory corridor for neotropical birds, raptors, and insects. The area is also a habitat for animals in danger of extinction or with special status, such as the black bear, golden eagle, peregrine falcon, white-tail deer, kit fox, rock squirrels, and others.

The proximity of the Maderas del Carmen, Coahuila Protected Area and Big Bend National Park has prompted cooperative projects and studies among the U.S. National Park Service, Mexico's INE, and local organizations.

Environmental Issues and Problems

Natural Resources

Wildlife populations in the region are threatened by activities such as human population growth, industrialization, proposed bridge crossings, and illegal species trafficking. Poaching and dry-season forest fires are of particular concern. Also, the recreational activities of tourists in the protected natural areas represent a threat to the conservation of the natural resources.

Sporadic mining in the Maderas del Carmen, Coahuila Protected Area should be regulated to prevent major impacts. The long-term viability of this region depends on the management partnership between the U.S. and Mexico at the federal, state and local levels to minimize environmental threats to the area.

As part of the effort to encourage efficient land use practices and sustainable production along the border, the joint support of regular exchanges and workshops between indigenous communities along the Texas-Coahuila-Nuevo Leon border should be implemented. Technical assistance is needed in order to develop agroforestry activities. Demonstration agroforestry and soil capacity sites will be established.

Technology transfer is needed for natural resources conservation, development of urban forests, and soil conservation. There is also a need for geographical information systems (GIS) and global

positioning systems (GPS) to enhance basic data about forestry and soils, wildlife, and other natural resources.

Water

The most significant environmental challenges in this region are related to water quality and quantity and their effects on human population and natural habitats. Water quality in the Rio Grande is of great concern to residents in the area, who identified illegal transport and dumping of waste products and lack of sewage systems in colonias as major problems.

The state of Coahuila has identified the following as significant water infrastructure issues: drinking water distribution; improvements to the Ciudad Acuña water treatment plant; insufficient sewage collection capacity; and the need for upgrades to inefficient sewage treatment plants. Due to insufficient capacity, new wastewater treatment plants are required in Piedras Negras and Ciudad Acuña.

Through analysis of the region's water infrastructure needs, CNA found that 90 percent of the population receives quality drinking water, 60 percent of the residences are connected to a sewer system, and approximately 43 percent of the current wastewater is treated, although the operation and capacity of the treatment plants is inadequate. In addition, the growth of the maquiladora industry has generated a greater demand on drinking water.

CNA has estimated resource requirements to meet the region's present infrastructure deficiencies as shown in Table 7.2.

TABLE 7.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Drinking water	1.0		1.0	2.0
Sewer systems	4.0	8.0	3.0	15.0
Treatment	1.0	4.0		5.0
Institutional strengthening	1.0			1.0
Increased efficiency	1.0	1.0	1.0	3.0
Studies and projects	0.4	0.2		0.6
Total	8.4	13.2	5.0	26.6

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

There are a wide variety of natural and artificial water stresses to aquatic habitats in this area of the border. Quantity and quality of water in the Rio Grande impact the biodiversity of aquatic resources, tourism, and local business.

The Rio Conchos joins the Rio Grande and normally provides significant flows. Flows from the Rio Conchos are important determinants of water quality and quantity in the region and thus have an important impact on the diversity and integrity of flora and fauna of the area.

Sewage and industrial discharge from the El Paso-Ciudad Juarez area, as well as upstream water use and reservoir release practices, affect the living resources that depend on water as a critical habitat.

Environmental Health

A diagnosis of environmental health should be carried out. Border residents in this region, like other residents of the U.S.-Mexico border, are vulnerable to various communicable diseases due to lack of an adequate environmental infrastructure. Texas border counties report the highest number of tuberculosis cases in the state, particularly single, dual, and multidrug-resistant cases. Other gastrointestinal illnesses such as hepatitis A, salmonellosis, shigellosis, and amebiasis are significant health threats in this region. Microorganisms found in untreated water also present a health risk. *Naegleria fowleri* has been detected in waters containing untreated sewage.

Air

An issue in this region is the deterioration of visibility in Big Bend National Park, a Class I protected area. Another area in the region that is experiencing visibility impairment is the Black Gap (Texas) State Refuge Area. Visibility is the ability to see the color, shape, contrast, and texture of a landscape or city skyline. While natural events such as wildfire can impair visibility, often man-made air pollution is the major cause of decreased visibility.

In 1993, concerns were raised over the possible degradation of the air quality in Big Bend National Park. To address these concerns within the framework of the La Paz Agreement, an adhoc binational workgroup exchanged views and information with the purpose of determining the possible effects on the air quality of the Park and the probable causes of any effects. This workgroup met regularly from 1993-1996. In May 1996, the two countries reached agreement on a multiyear field study to explicitly determine source-type contribution.

Hazardous and Solid Waste

Residents expressed significant concern about the types, quantities, and destinations of hazardous materials and wastes transported through their neighborhoods and city centers. Community and government concerns stem from increased crossings of the Eagle Pass-Piedras Negras border and projections that commercial transportation across the international boundary will likely increase with the phase-in of NAFTA.

Contingency Planning and Emergency Response

On both sides of the border, in some urban areas the capacity to respond to environmental emergencies is inadequate, particularly with regard to training and equipment. The volume of materials and wastes that are transported through communities in Texas, Coahuila and Nuevo Leon, highlights the need for adequate response capabilities in the event of emergencies, including properly trained staff and equipment to respond to accidents that may present a threat to public health and the environment.

Cooperative Enforcement and Compliance

Because of the growing concentration of population and industrial activity, compliance with environmental requirements is essential for health and welfare in the area. Local, state and federal agencies involved in enforcing environmental laws and promoting compliance can improve their effectiveness through cooperation.

A monitoring program is addressing the problem of pollution generated by the maquiladora industry, dictating preventive or corrective measures so that the companies comply with the parameters outlined by the Official Mexican Standards. PROFEPA has visited 100 percent of the maquiladora industry and the national companies with the highest pollution potential, requiring the installation of emissions control equipment, adequate facilities for hazardous waste control, and for companies with high risk, an accident prevention program.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NATURAL RESOURCES			
Maderas del Carmen Protected Area-Coahuila: Conservation, education and community outreach	1995-1996	NPS, FWS, INE	Specialized environmental education, ecotourism workshops, and conservation training courses designed for communities adjacent to the protected reserve.
Management program for the Maderas del Carmen Flora and Fauna Protected Area	1995- 1996	INE, PROFAUNA	The first draft of the management plan has been generated and will be proposed and discussed with local citizens and authorities to create a final version.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Ecology of the black bear in Coahuila and two studies in Maderas del Carmen Protected Area	1993-1996	Caesar Kleberg Wildlife Research Institute, UANL; Joint U.S.-Mexican Committee for Wildlife Conservation, FWS, INE	Carry out a population study of the black bear in northern Coahuila and Sierra del Carmen.
Assessment of the dwarf parrot endangered species in the Sierra Madre Oriental, Mexico	1994	Joint U.S.-Mexican Committee for Wildlife Conservation, UAAAN, FWS, INE	Know and protect the populations of the dwarf parrot in the northern Sierra Madre Oriental.
Biological inventories in the Maderas del Carmen Flora and Fauna Protected Area, Coahuila	Ongoing	INE, CONABIO, BRD	Begin the flora and fauna inventories in the protected area.
Study of the eastern mountain parrot endangered species of the northern portion of the Sierra Madre Oriental, Mexico	1993	Joint U.S.-Mexican Committee for Wildlife Conservation, UAAAN, FWS, INE	Carry out a population study of the eastern mountain parrot in the northern region of the Sierra Madre Oriental.
Impacts of environmental contaminants on the Aplomado falcon and ocelot of the Lower Río Grande Valley	Ongoing	BRD, FWS, TPWD	Blood samples have been collected and analyzed. Report in progress.
Maderas del Carmen Protected Area in Coahuila, community education regarding conservation	1995	Joint U.S.-Mexican Committee for Wildlife Conservation, INE, NPS, PROFAUNA	Organize environmental education programs for communities in order to teach the importance of resource conservation in the protected area.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
WATER			
Colonias Wastewater Treatment Assistance Program (CWTAP)	1993-Ongoing	EPA, TWDB	Grants are provided to local governments and nonprofit water supply corporations for design and construction of wastewater collection and treatment facilities. The program is administered by TWDB.
Economically Distressed Areas Program (EDAP)	1989-Ongoing	TWDB	
Colonia Plumbing Loan Program (CPLP) in Texas	1991-Ongoing	EPA, TWDB	Loans are made available to low income colonia residents in designated border counties for residential plumbing improvements. Funds are administered at the local level.
Texas Colonias Enforcement Strike Force	1994-Ongoing	EPA, Texas Attorney General	This program supports the Texas Attorney General in the enforcement of state laws relating to colonia developments.
Study of barriers to colonias infrastructure	1993-1994	EPA, International City/County Management Association	A report on identifying barriers to achieving local government interest in colonias sanitation problems has been published.
Colonias Assistance and Management Support Program (CAMSP)	1994-Ongoing	EPA, TWDB	This program provides overall management and coordination to eligible colonias in order to submit an application for financial assistance to implement needed drinking water and wastewater facilities improvements.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Circuit rider for technical assistance for public water systems along U.S.-Mexico border	1994-Ongoing	EPA, TNRCC	The objective of this program is to help utilities along the border to comply with state and federal regulations in a cost-effective manner. It also helps to ensure that water and wastewater utility services are maintained and expanded, where possible, by identifying financial resources and helping utilities access these resources.
Municipal On-site Wastewater Assistance Program	1994-Ongoing	EPA, TWDB	Small communities have been assisted with an onsite technical assistance program for small community wastewater treatment plant operators developed by the TWDB.
Binational wastewater operator training	1995-Ongoing	EPA, WEF	The first training session for wastewater treatment plant operators along the border has been conducted in a binational forum.
Binational water supply operator training	1995-Ongoing	EPA, American Water Works Association	The first training session on the requirements of the Safe Drinking Water Act has been conducted in a binational forum.
Rio Grande Water Quality Middle Basin Monitoring Plan (Amistad to Falcon Reservoir)	1996 - 1999	TNRCC, USGS	Developing monitoring plan; sampling will start in 1997.
Groundwater assessment		TNRCC, USGS, TWDB	
Rio Grande Toxics Baseline Study	1992-1993	EPA, IBWC, DOI, TNRCC, TDH, TPWD	Binational report completed in September 1994. While the study did not indicate that toxic contamination was widespread, several areas with elevated levels of toxic contamination were found, primarily below sister cities and in tributaries.
Rio Grande Toxics Study Follow-up	1995-Ongoing	EPA, IBWC, TNRCC	Field work completed. Report will help identify areas where additional water pollution control is needed.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Rio Grande/Rio Bravo Alliance	1995-Ongoing	Stakeholders throughout the Rio Grande Basin, including EPA, TNRCC, Mexico, New Mexico, Colorado state and federal environmental entities, Tribal representation, and nongovernmental organizations. Other local stakeholder participation.	The Rio Grande Alliance had its first coordinating meeting on July 15-16, 1996 in El Paso, Texas. This meeting included participants from throughout the Rio Grande Basin, including Mexico, New Mexico, Colorado, and Tribal representation.
Rio Grande cities facilities planning	1995-Ongoing	EPA, IBWC	U.S. Section of the IBWC has procured A/E firms to develop planning of wastewater facilities to control wastewater discharges from Mexico into the Rio Grande.
Drinking water treatment plant in Piedras Negras	1992 - Ongoing	CNA	One module for 250 lps was completed and a second treatment module with the same capacity is near completion.
Sewer system in Piedras Negras	1994-1996	CEAS	Some of the sewers and collectors have been rehabilitated and/or replaced leaving the major part of the project still to be completed.
Sewer system in Ciudad Acuña	1994-1996	CEAS	Some of the sewers and collectors have been rehabilitated and/or replaced leaving the major part of the project still to be completed.
Rio Grande Basin Study from the International Amistad Dam to the Gulf of Mexico	1992-1995	BOR	Completed and published a report in December 1995.
Texas border infrastructure needs assessment		TNRCC, TWDB	

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
ENVIRONMENTAL HEALTH			
Birth Defects Registry	Pilot began 1994 in TDH Regions 11 & 6 Expansion in 1997 to Regions 2, 3, 5, and South 8, 9, 10	TDH, March of Dimes, CDC	Pilot Birth Defects Registry. Expansion of Birth Defects Registry. Statewide cluster investigation. Referral information services. Folic Acid Prevention Assessment. Establishment and coordination of Scientific Advisory Committee on Birth Defects in Texas.
Border Cancer Registry	Ongoing	TDH, CDC	Completed cancer incidence data collection and analyses for 18 border counties for 1990-1992. Continuing to collect incidence data for 1993 and forward. Report being published.
Border Environmental Health Survey	1996-1997	TDH, EPA, CDC	About 2,100 household surveys will be conducted along the Texas-Mexico border to collect data on household structure, general sanitation, health conditions, and potential sources of exposure to environmental contaminants.
Binational Manager and Tracking and Referral System	1995-Ongoing	TDH, EPCCHD Migrant Clinicians' Network	Under development. Toll-free access to TB information from anywhere in Mexico or the U.S.
Texas Small Towns Environment Program (STEP)	1994-Present	TDH, TNRCC, Texas Dept.of Housing & Community Affairs, TGLO, TWDB	Interagency project to assist small communities to meet their water and wastewater needs through self-help/sweat-equity. Interagency work group. Initial thrust is in colonias along the Texas-Mexico border. Four current border projects: one in construction, three in various stages of design/planning /assessment. Newsletter.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NTD Field Surveillance Interventions and Case-Control Study	1995-1996	TDH, CDC, EPA	Three years of surveillance data are complete. More than 60 percent of high risk women are taking folic acid. Case-control study for risk factors for NTD occurrence has been implemented.
AIR			
Big Bend air quality studies	1994-1996	EPA, NPS, TRNCC	Modeling studies have been conducted. The MESOPUFF-CALMET model was used to develop a base of information on regional visibility and attempt to quantify any long-term visibility trends.
Big Bend Air Quality Workgroup	Ongoing	NPS, EPA, INE	Both countries have agreed to conduct a regional study of possible pollution sources impacting Big Bend National Park. The Big Bend Air Quality Study will involve analysis of monitoring data to "fingerprint" source types responsible for visibility degradation in the area. NPS and PROFEPA are leading the effort in the summer of 1996, with 19 monitors to determine the scope of subsequent longer studies projected for summer and winter in 1997-1998.
Piedras Negras and Ciudad Acuña air quality monitoring	Ongoing	INE, State of Coahuila, EPA, Piedras Negras, Ciudad Acuña, TNRCC	INE has provided four PM-10 samplers and an SO_2 analyzer which are awaiting installation and operation. EPA is currently providing technical assistance in the areas of monitoring network siting and human resource requirement for operation and maintenance of monitoring networks.
Eagle Pass air quality monitoring	Ongoing	TNRCC	Conducted air toxics monitoring from a mobile station.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
HAZARDOUS and SOLID WASTE COOPERATIVE ENFORCEMENT and COMPLIANCE **(Please see Appendix 10 for additional hazardous and solid waste projects U.S. state and local agencies)**			
Outreach and training to maquiladoras on regulatory requirements for transborder shipments of hazardous waste	1988-1993	EPA, SEDESOL, TNRCC, NMED, US and Mexican Customs, DOT, National Maquiladora Association, SCT, Cal-EPA, ADEQ	Six borderwide conferences were held to increase understanding by maquiladoras and U.S. parent companies of import/export regulations. Developed bilingual manual for the maquiladora industry.
Study the environmental impact of sanitary landfills; integrated study of the existing status for solid wastes (Piedras Negras)	1994	B.M., SEDESOL	Implementation plan for work and equipment needs for solid waste pilot projects.
Determine feasibility for integrated management of solid wastes in Acuna, Coahuila	1993-1994	SEDESOL, Municipal government	Feasibility study for granting a service concession for public sanitation.
Enforcement Task Force	Ongoing	TNRCC, EPA, PROFEPA, U.S. and Mexican Customs, U.S. DOT, TDPS	Pursuant to an EPA grant, TNRCC established a multiagency task force in Del Rio to explore enforcement issues of the area.
Education and training	Ongoing	EPA, TNRCC	Pursuant to an EPA grant, TNRCC provides training to address transboundary hazardous wastes issues. TNRCC also established an information program and hot line for the public.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Enforcement of hazardous waste regulations using manifests and associated shipment data from HAZTRAKS, a binational computerized tracking system, to identify potential violators	Ongoing	EPA, TNRCC	A number of enforcement actions have been filed (administrative and judicial).
Inspections, investigations of hazardous waste transporters at key border crossings (e.g., weigh stations, transporter yards, hazardous waste warehouses) to find illegal shipments	1993-Present	EPA, PROFEPA, TNRCC, U.S. and Mexican Customs, U.S. DOT, TDPS, TDH	Monitor the import/export of hazardous wastes through a cooperative multiagency initiative to determine if shipments conform to applicable laws and regulations.
Transboundary enforcement	Ongoing	EPA, TNRCC	EPA funded one TNRCC position to enforce regulatory requirements on transboundary movement of hazardous wastes.
International bridge inspections	Ongoing	EPA, TNRCC	Pursuant to an EPA grant, TNRCC conducted two international bridge inspections on hazardous wastes shipments crossing the border.
U.S. Customs training course	1995	EPA, U.S. and Mexican Customs, TNRCC	Pursuant to an EPA grant, TNRCC conducted one Customs training course on regulations pertaining to transboundary movement of hazardous wastes.
Establish an information program and a direct telephone line	1996	EPA, PROFEPA	A forum for border communities to approach issues that may affect them like the transborder movement of hazardous waste.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Outreach to maquiladoras on the regulatory requirements for transboundary shipments of hazardous wastes		EPA, SEMARNAP, TNRCC	Increased understanding by maquiladoras of regulations and the import/export community of shipment requirements, pollution prevention opportunities and waste management.
Inventory of solid waste landfills	Ongoing	EPA, TNRCC	Pursuant to EPA grants, an inventory of active solid waste landfills along the border was conducted. Training on landfill design, operation and closure was provided to Mexican officials and landfill owner/operators.
Assessment of illegal dumps	Ongoing	EPA, TNRCC	TNRCC is evaluating the scope of illegal dump problems and assessing collection/disposal needs.
POLLUTION PREVENTION			
Video conference on Permanent Pollution Prevention Program (P4) broadcast through ITESM	1995-Ongoing	TNRCC, ITESM	A four-hour video broadcast was downlinked at 8 Mexican cities through ITESM. Ongoing plans are developing for an extension of this P4 to downlink to 26 satellite campuses throughout Mexico to reach the maquiladora industries.
Technology transfer and capacity building on pollution prevention with PROFEPA	1995-Ongoing	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, and Nuevo Leon	Joint partners site assessments and follow-up site visits are focused on determining opportunities to implement pollution prevention and clean technology for Mexican industrial facilities. These have resulted in reductions in wastes and air emissions and have also cumulatively saved facilities over a million dollars through pollution prevention.
Pollution prevention assistance to small business operations	1996	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, and Nuevo Leon, EDF	Demonstration of a model spray booth for training of operators in the auto and paint shop industry.

TABLE 7.3
PAST AND ONGOING PROJECTS - TEXAS-COAHUILA-NUEVO LEON

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Technical assistance to Mexican state environmental agencies	1995-Ongoing	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, Nuevo Leon	Continue capacity building with Mexican state and federal environmental agencies by providing training and technical assistance in the four Mexican states bordering Texas.
Solid waste recycling initiatives	1995-Ongoing	EPA	Solid Waste and Recycling Conferences were held in April and October 1995; and February 1996. On May 22-23, 1996 a conference was held in Nuevo Leon.

Objectives for the Next Five Years

Natural Resources

- Promote studies to research habitats and wildlife species to begin management and protection programs (e.g., rehabilitation of Chihuahuan Desert habitats). This research should focus on biodiversity and the sustainable use of resources specifically in the Maderas del Carmen Protected Area, Coahuila.

- Promote protection and conservation programs and establish controlled production units as a strategy for the restoration of threatened and endangered wildlife species, such as the black bear, white-tailed deer, puma, bats, cactus, conifers, and others.

- Begin a program for the management of the Maderas del Carmen Protected Area in Coahuila. Establish an organizational structure and inspection and monitoring committees for protected areas. Promote projects and activities that offer sustainable development alternatives for nearby residents. Design strategies for the long-term financial self-sufficiency of this protected area.

- Carry out biological inventories in the Maderas del Carmen Protected Area, coordinated with CONABIO and INE, and in Big Bend National Park and its environs, coordinated with the U.S. National Biological Service.

- Carry out training, workshops, and exchanges of experiences between people from both countries in conservation and management of protected natural areas and sustainable use of natural resources.

- Assess existing agroforestry activities, compliance with regulations, and technology in the Texas-Coahuila-Nuevo Leon area. Following the assessment, demonstration sites of preferred agroforestry systems will be implemented and will be used as an educational site for local landowners.

- Provide training in nursery management and planting techniques in order to improve the quantity and quality of nursery stock as well as to improve the survival rate of seedlings planted in the field.

- Pursue opportunities for collaboration in developing windbreaks around agricultural lands as well as the development of commercial plantations for wood products and non-wood products (e.g. Christmas trees).

- Establish an aquaculture program for rural areas, including a training component for local residents.

- Develop a fish-stocking program in the La Amistad Reservoir, under the Convention for the Use of Surface Waters.

Water

- Inherent in the efforts to protect surface and groundwater resources is the need to improve urban infrastructure associated with the supply of drinking water and the disposal of wastewater. Both governments see the importance that the Rio Grande has to sustainable development, therefore, they will jointly work on the analysis of the basin, especially in reference to the infrastructure needs of drinking water and wastewater in the cities and communities along the river. EPA and CNA will continue to work with BECC and IBWC to support planning projects in the cities along the Rio Grande.

- The second phase of the Rio Grande Survey began in 1995. In 1996, the U.S. will continue to work with Mexico to complete the studies and begin analyzing the data and preparing the reports.

- In the U.S., the greatest need is for water and wastewater infrastructure in colonias and small communities. In Mexico, the greatest need is for water infrastructure in municipal areas; however, this need also exists in smaller communities. Comprehensive planning for the Rio Grande watershed will help both governments identify water quality problems.

Environmental Health

- In-depth discussion of binational, geographic-specific five-year objectives has only commenced in earnest with the issuance of the Framework Document. The intent is to translate the overall environmental health objectives outlined in Chapter III into objectives, priorities, and projects specific for this region benefiting from further binational discussions and the input obtained from community outreach meetings.

Air

- Air monitors are needed in the Eagle Pass and Del Rio areas to assess baseline air quality.

- If baseline air quality measurements indicate violations of health standards, the following data objectives should be established: expansion of the emissions inventories and the monitoring network, increased equipment, operation and maintenance of the Automatic Air Quality Monitoring Network, and sample analysis and quality assurance of the data. This information will be compiled to assist in the application of models for designing control activities.

- The public's concern regarding air quality in Big Bend National Park is reflected in the overall goal of preventing further deterioration of the environment. The U.S. and Mexico aim to arrive at a mutual understanding and to reach consensus on the dynamics of visibility deterioration in the region. The two governments have agreed to perform an extensive regional field study aimed at assessing the issues of visibility and air quality at Big Bend. NPS and PROFEPA are leading the effort in the summer of 1996 to determine the scope of subsequent longer studies projected for summer and winter in 1997-1998. Both countries will evaluate the results of the field study and will determine the next steps to be undertaken.

Hazardous and Solid Waste

- Proper management, treatment, and disposal of hazardous and solid wastes as well as compliance with regulations for transboundary shipments of hazardous wastes will remain a priority for the Texas-Coahuila-Nuevo Leon region. Continued cooperation among the state and local offices will focus on:
  - ongoing information and technology transfer;
  - cooperative training;
  - building laboratory sampling and analysis capabilities;
  - developing recyclables markets; and
  - using and improving HAZTRAKS as a tracking and compliance tool.

- One of the principal actions will be to improve waste management practices in the Texas-Coahuila-Nuevo Leon region and promote solid and hazardous waste minimization and recycling. This will be accomplished by:
  - Developing partnerships with industry to encourage waste minimization and safe material management.
  - Providing site-specific compliance and technical assistance on an as-needed basis.
  - Training government officials, community leaders, and industry on waste reduction and pollution prevention.

Contingency Planning and Emergency Response

- Both governments will develop state and local capacity for contingency planning, as well as emergency response in the areas of Del Rio-Ciudad Acuña and Eagle Pass-Piedras Negras. This will be accomplished through the Joint Response Team which involves federal, state and local agencies with responsibilities for dealing with environmental emergencies through implementation of the Joint Contingency Plan in these sister cities, the creation and promotion of CLAMs, the creation and equipment of communication and emergency response centers, training of staff involved in emergency response, and communication with the public, among other activities.

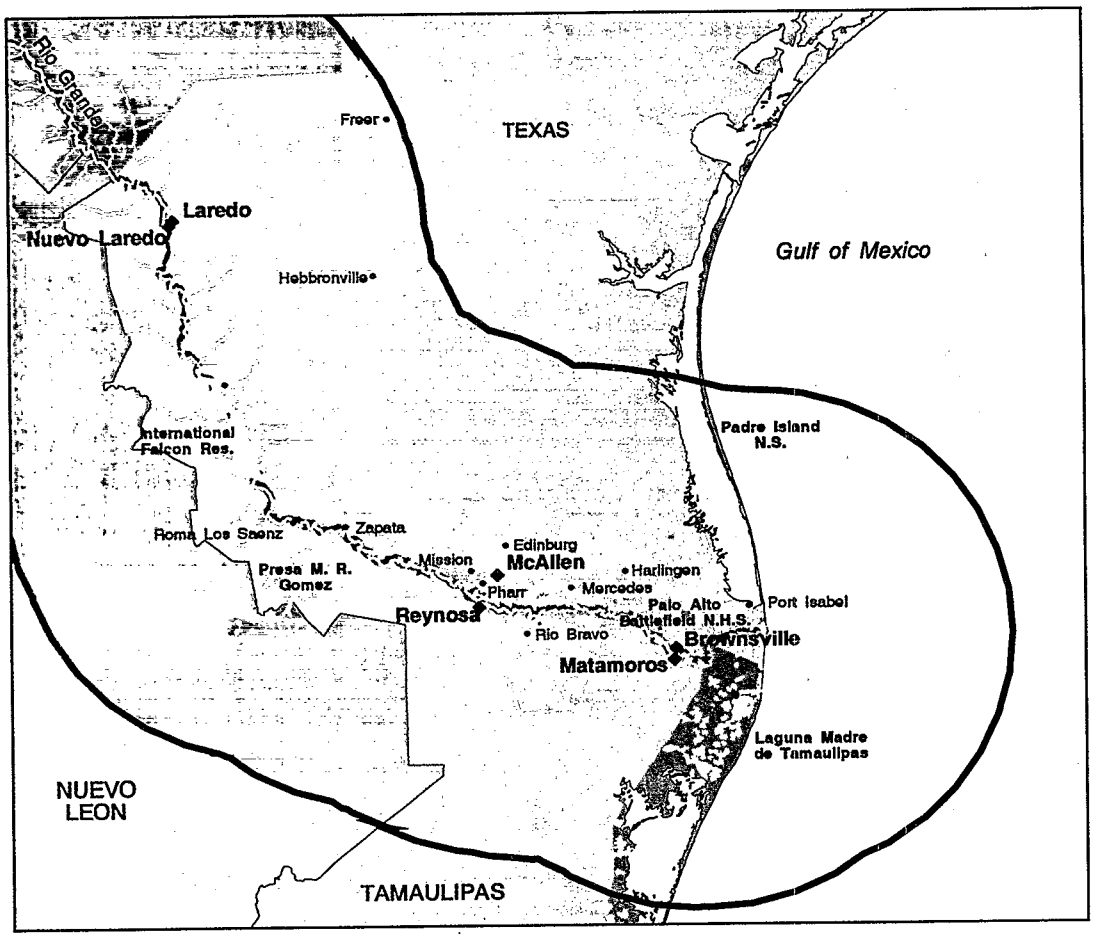
Cooperative Enforcement and Compliance

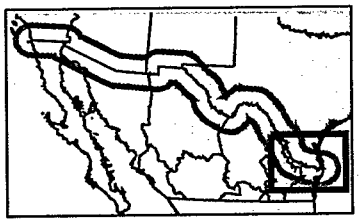
- The Cooperative Enforcement Work Group will promote the establishment of a subgroup for the Texas-Coahuila-Nuevo Leon region, which will have the responsibility of meeting the objectives outlined in Chapter III.

- A group, formed by the agreement between PROFEPA and the government of the state of Coahuila, will provide technical and legal support, and laboratory analysis, for the General Ecology Directorate of the state to share with municipalities requiring such services. This will permit local authorities, in coordination with PROFEPA, to address ecological problems within their own capacity, using federal infrastructure and expertise.

- The PROFEPA inspection program expects to carry out 3,700 inspections in Coahuila and 2,600 inspections in Nuevo Leon, between 1996 and 2000, to monitor regulatory environmental compliance.

Texas-Tamaulipas Region





- City
- Sister City
- State Boundary
- U.S./Mexico Border
- 100km Buffer
- Water Body
- Protected Area

CDSI
Computer Data Systems Inc.
Map created by CDSI
September 25, 1996

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100 0 Miles

Sources: Digital Chart of the World, TNRIS, National Parks Service, TXP&W

EPA Region 6
GIS Team
Dallas, Texas

CHAPTER VIII

TEXAS-TAMAULIPAS

In order to promote a regional approach to environmental problem solving, this chapter focuses on environmental issues and problems, past and ongoing projects, and objectives that are specific to the Texas-Tamaulipas area of the border region. The borderwide objectives and ongoing activities described in Chapter III also pertain to the Texas-Tamaulipas border region.

Brief Overview

The Texas-Tamaulipas region stretches approximately 335 miles (540 km) along the international boundary from just north of the Laredo area to the Gulf of Mexico. The major sister cities include Laredo-Nuevo Laredo, McAllen-Reynosa, and Brownsville-Matamoros.

TABLE 8.1
POPULATION

Population Center	1980 Population	1990 Population	1995 Population
Laredo, Texas	99,000	133,000	162,000
Nuevo Laredo, Tamaulipas	203,000	220,000	275,000
McAllen, Texas	66,000	84,000	101,000
Reynosa, Tamaulipas	213,000	283,000	337,000
Brownsville,Texas	85,000	99,000	131,500
Matamoros, Tamaulipas	239,000	303,000	363,000
Total	905,000	1,122,000	1,369,500

- U.S. population figures for 1980 and 1990 come from the U.S. Census for the metropolitan areas; 1995 estimates are from the Texas State Data Center Estimates and Population Program prepared by Department of Rural Sociology, Texas Agricultural Experiment Station, Texas A&M University System, January 1, 1996 population estimate.
- Mexican population figures for 1980 and 1990 come from the X and XI INEGI Census. Data for 1995 comes from the 1995 INEGI Count of Population and Housing.

This population forms an important part of the growing binational economy of the region. Of the working-age population in the Tamaulipas border zone, nearly 30 percent work in the industrial manufacturing sector; 15 percent work in the service sector; and 5 percent work in agriculture, livestock, and fisheries.

The Tamaulipan ecosystem, which is semi-arid and hot, extends throughout Texas and northeastern Mexico. Tamaulipan brushland is composed of several distinct biotic communities. Most are characterized by dense, woody, and usually thorny vegetation and a very high degree of biological diversity. Vegetation is more lush and taller in the riparian areas than in the dry uplands. Uplands are sometimes veined with thin riparian areas known as 'ramaderos,' which not only provide important nesting and feeding habitat, but also serve as corridors for animal movement. Tamaulipan brushland is home to more than 600 vertebrate species and more than 1,100 species of plants. Of these species, approximately 70 are considered endangered or threatened by the U.S. Fish and Wildlife Service (FWS) and the Texas Parks and Wildlife Department. Many animals and plants of this area are not found anywhere else in the United States or Mexico. Some, including the jaguarundi and the ocelot, are endangered throughout their range. This ecosystem is also important as nesting, wintering, and stopover areas to thousands of migratory birds.

The Rio Grande is a major watershed within this ecosystem, and is therefore essential to the continued survival of resident and migratory fauna as well as flora. Besides providing habitat for endangered species and nesting for wintering birds, the narrow greenbelt surrounding the Rio Grande supports those unique species of neotropical affinities, which reach their northernmost limits here. The Rio Grande provides essential freshwater inflow creating estuarine and nutrient-rich conditions vital as nursery grounds for finfish and shellfish. The Rio Grande also provides important sediments that play a basic role in tidal flat, lagoon, and barrier island development.

The coastal prairie essentially encompasses the Gulf Coast region of the Laguna Madre. Coastal marshes, dominated by Spartina grass, are continuous along the Gulf Coast. As one of only two large hypersaline lagoons in the world, the Laguna Madre is rich in biodiversity. Its fragile estuaries are extremely productive, providing a base for a significant commercial and recreational fishing industry. Many coastal species, such as the redhead duck, overwinter in the Laguna Madre. Among the most important habitats in the Laguna Madre area are islands established as 'rookeries' by nesting birds such as the rare reddish egret, herons, spoonbills, sea gulls, and the white pelican.

The Lower Rio Grande Natural Wildlife Refuge was established to help protect, preserve, and restore the less than 5 percent remaining natural habitat in the Lower Rio Grande area. The Lower Rio Grande, Laguna Atascosa and Santa Ana Natural Wildlife Refuges, Padre Island National Seashore, as well as state and privately-owned habitat management areas support hundreds of species of migrant birds on their stopovers en route to Mexico, and Central and South America. In addition, these managed areas within the Texas-Tamaulipas zone will likely be core areas for fish and wildlife resources if development of privately-owned land continues.

Environmental Issues and Problems

Natural Resources

Along the Texas-Tamaulipas border, human activities associated with increased industrialization, urbanization, infrastructure development, and agricultural development have negatively affected habitat and important national historic sites. This zone is impacted not only by chemicals and fertilizers from crop production, but also a wide range of municipal and industrial pollutants, which are having an effect on the fish and wildlife fauna. Specifically, water of sufficient quality and

quantity must be maintained in the Lower Rio Grande to ensure the biodiversity of aquatic fauna and flora.

Construction of additional infrastructure, including storage dams, additional diversions, international bridges and bridge expansion, intracoastal canals, and ports could have significant impacts in the future. The cumulative effects of these projects are considered likely to significantly affect fish and wildlife resources as well as recovery efforts of the endangered ocelot and jaguarundi, marine turtles, migratory birds and other listed endangered and threatened species. Impacts to the shared resources need to be given maximum consideration.

The direct discharge of wastewater and dredge spoil material to the Laguna Madre in Texas is causing extensive loss of sea grass and marine algae habitat. This vegetation is critical to the productivity of the Laguna Madre in the Texas-Tamaulipas region as it provides nursery areas for commercially important fish and invertebrates, as well as feeding areas for migratory waterfowl and the federally protected marine turtle.

Mariculture is a new and expanding agroindustry in the region, and is an additional source of contaminants and nutrients to the Arroyo Colorado and the Laguna Madre. The threat of introduction of nonnative species and their diseases by mariculture operations is currently a high-visibility environmental concern.

The Gulf of Mexico Program was initiated in 1988, and has partners from 18 federal agencies, nearly 70 state agencies, and many NGOs, environmental organizations, and industries. The program addresses eight major topic areas of concern: coastal and shoreline erosion, freshwater inflow, habitat degradation, living aquatic resources, marine debris, nutrient enrichment, public health, and toxic substances and pesticides.

Effective management of migratory species will continue to require the coordination of federal, state and international regulatory actions. Accurate determination of the status of western Gulf of Mexico resources will require increased information exchange. The state of Texas has been involved in a working relationship with EPA on the coastal area. Texas has submitted its plans for coastal zone management to NOAA/OCRM. This will have a significant impact on the eligibility of this area for federal funds, alter the way permits are issued for development near beaches, bays, and estuaries, and create a coordinating mechanism for various state, federal, and local agencies involved with the coastal environment. Texas General Land Office has expressed interest in working with authorities of SEMARNAP and Tamaulipas on a coordinated coastal management plan. This would include planning associated with all of the Laguna Madre system and associated barrier islands.

The populations of some fish and shellfish incidentally caught by shrimpers, are currently at low stock levels. Regulations which require the use of screening devices on shrimp boats are now reversing this trend. Marine debris from shrimpers and commercial shipping is a major problem on Padre Island beaches.

As part of the effort to encourage improved land use practices along the border, the joint support of regular exchanges and workshops between indigenous communities along the Texas-Tamaulipas border needs to be expanded. Technical assistance is needed in order to develop agroforestry.

Demonstration sites can be established to provide a working model of agroforestry and the capabilities of the soils.

Water

Water supplies in the Lower Rio Grande are limited, and increasing demands are a growing problem. Shared water of the Rio Grande and its tributaries from below international Amistad Dam to the Gulf of Mexico is currently the primary source for meeting all uses on both sides of the border. But as population and water demands increase, the use of groundwater may also increase as competing water needs include municipal and industrial use. It is necessary to protect water quality in the Rio Grande, adjacent streams, oxbows (resacas), bays, estuaries, and aquifers. Controlling point and nonpoint biological and chemical pollution demands effective enforcement.

Other water-related issues raised by local residents include illegal dumping of waste in water bodies that flow into the Rio Grande; the need for domestic water supply and the lack of coordination of infrastructure services in the colonias; the need for a binational watershed plan; the negative impact ocean dumping has on the fishing industry and on beaches; and the need for cleanup of the small lakes and oxbows along the Rio Grande. The Gulf of Mexico beaches near Brownsville were cited as areas of concern for surface water quality.

Valle Hermoso and Matamoros are constructing aqueducts as part of the decommissioning of intakes from the irrigation district. Nuevo Laredo has constructed a new treatment plant and another treatment plant is planned in Matamoros.

Through analysis of the region's water infrastructure needs, Mexico's CNA found that 80 percent of the population receives quality drinking water, 66 percent of the residences are connected to a sewer system, and 35 percent of the total wastewater discharge is treated. The principal problem with the sewer systems is the need for infrastructure expansion, while sewage treatment plants are required in Rio Grande, Matamoros, and Nuevo Ciudad, Guerrero. All existing plants require maintenance and some require improvements. Though unable to identify long-term resource commitments at this time, CNA has estimated the following resource requirements to meet the region's infrastructure deficiencies as shown below in Table 8.2.

TABLE 8.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Drinking water	14.0	7.0	5.0	26.0
Sewer systems	10.0	14.0	13.0	37.0
Treatment	21.0	7.0	7.0	35.0

TABLE 8.2
RESOURCE REQUIREMENT ESTIMATES FOR WATER INFRASTRUCTURE*

Project Component	Investment (Million $U.S.)			
	Urgent 1996-1997	Short term 1998-1999	Medium term 2000	Total
Institutional strengthening	4.0	4.0	2.0	10.0
Increased efficiency	5.0	3.0	3.0	11.0
Studies and projects	0.2	0.6		0.8
Total	54.2	35.6	30.0	119.8

* These estimates are based on studies and evaluations conducted by the Government of Mexico to meet domestic standards.

Environmental Health

A diagnosis of environmental health should be carried out. The high incidence of communicable diseases is a major concern along the Texas-Mexico border. Examples of various public health concerns common to this area are tuberculosis and gastronintestinal diseases in the border communities of Texas-Tamaulipas, and the spread of cholera into Mexico. The U.S. portion of the Texas-Mexico border region is considered a high risk area for neural tube defects.

Air

Air pollution is seen as a significant problem by residents of Laredo-Nuevo Laredo, Brownsville-Matamoros, and McAllen-Reynosa particularly with regard to the air quality impacts of high commercial vehicle traffic. Residents called for more air quality monitoring in order to fully understand the extent of air problems and to characterize the contribution of industry to air pollution within the binational air basins. Given public concerns regarding the potential connection between air pollution and the incidence of neurological defects, community residents requested a study to evaluate the nature of these potential associations.

Hazardous and Solid Waste

The public is aware of inadequate solid waste disposal practices and perceives a lack of landfills and other resources required for the proper operation of community garbage disposal programs. Area residents called for the reduction of hazardous and solid waste by industry and commercial facilities such as paint shops. Curbside recycling is seen as incomplete in Brownsville. Residents called for recycling efforts by small businesses such as automobile repair and paint shops. Brownsville residents are concerned about the possible impact of the burning of municipal waste in Mexican solid waste facilities on the binational airshed.

Residents of the region expressed significant concern about the types, quantities and destinations of hazardous materials and wastes transported through their neighborhoods and city centers.

Community and government concerns stem from the high number of crossings and the projections that commercial transportation across the international boundary will likely increase with the phase-in of NAFTA.

Contingency Planning and Emergency Response

In some urban areas, on both sides of the border, there is inadequate capacity and resources, especially in terms of training and equipment to respond to environmental emergencies. The volume of hazardous materials and hazardous waste that is transported in Texas-Tamaulipas communities demonstrates the need to develop and implement an adequate emergency response program. This includes adequately trained staff and equipment necessary to respond to emergencies. The lack of an adequate emergency response program could represent a risk to public health and the environment.

Cooperative Enforcement and Compliance

Because of the growing concentration of population and industrial activity, compliance with environmental requirements is essential for health and welfare in the area. Local, state and federal agencies involved in enforcing environmental laws and promoting compliance can improve their effectiveness through cooperation.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NATURAL RESOURCES			
Baseline study to determine the area for a natural protected area in the Laguna Madre, Tamaulipas	Ongoing	INE, DUMAC	This study would propose an area of interest, with a description and dimensions of the area to justify establishing of a protected area.
Flora and fauna inventory of the Laguna Madre, Tamaulipas	Ongoing	INE, Instituto de Ciencias del Mar y Limnología, UNAM	An inventory will be obtained of the flora and fauna species of the northern region of the estuary system of the Laguna Madre through field work, the review of collections and herbariums, and through a review of relevant literature.
Restoration of the native habitat on Beaver Island in the lower Rio Grande corridor	1995	INE, FWS, Los Caminos del Rio, A.C.	Initiate a reintroduction and restoration program of the endemic flora species on Beaver Island in the lower Rio Grande corridor.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
White-winged dove conservation	1993-1994	SEDESOL, FWS, DUMAC, UAT	Completed a conservation program along the northern Mexican border.
Ecology of the redhead duck, Laguna Madre, Tamaulipas	1993	SEDESOL, FWS, UAT	Determined the distribution and population structure of the redhead duck.
Study of aquatic bird resting colonies in the Laguna Madre, Tamaulipas	1993	SEDESOL, FWS, NAS	Determined the distribution and number of resting colonies of aquatic birds.
Conservation program for the Kemp's Ridley sea turtle in Rancho Nuevo, Tamaulipas and the Texas coast	1991-Ongoing	FWS, SEMARNAP/INP, BRD	Concentrated efforts to recover the Kemp's Ridley sea turtle which nests in the state of Tamaulipas and Texas. Carry out reproduction, movements, migration, and population dynamics.
Biodiversity conservation in the lower Rio Grande Valley, Texas	1995-1996	FWS, TPWD, TNRCC, IBWC	Maximize resources protection, habitat conservation planning, Section 7 consultations and recovery efforts in the lower Rio Grande Valley.
Revegetation of Tamaulipan brushland in the lower Rio Grande Valley, Texas	1995-1996	FWS	Revegetation of characteristic plant communities in order to increase available wildlife habitats and link habitat for neotropical wildlife such as the ocelot.
Linking contaminant impacts to the status of biological resources of the lower Rio Grande	1995-Ongoing	BRD	1995 sampling completed - report in progress. 1996 sampling underway.
Lower Rio Grande Ecosystem Initiative	1996	NPS, FWS, USGS, CONABIO, BRD	Information currently being developed; biodiversity research underway.
Point and nonpoint source contamination of fish and wildlife of the lower Rio Grande, Texas	1995	FWS, BRD, TPWD, IBWC	Identify point and nonpoint source pollution to fish and wildlife resources from Falcon Reservoir to the mouth of the Rio Grande.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Natural resource conservation through education and outreach	1995-1996	FWS	Emphasize public outreach and environmental education of conservation initiative along the U. S. - Mexico border.
Falcon Reservoir Sediment Core Study	1996-1998	USGS, TNRCC	Data collection has been initiated.
Improvement of forest genetics of threatened and endangered tree species	Ongoing	USFS, NE Station, INIFAP (Canada), SEMARNAP	Improved seed quality of pine species such as Chihuahua pine.
Classification system for wetlands	Ongoing	DUMAC, DU, Inc., NAWCC, AGFD	Proposal for wetlands and classification in process.
Practices for the sustainable ongoing use of forests	Ongoing	USFS, SEMARNAP-Chihuahua, ejidos	Develop BMP manual and training seminars in both U.S. and Mexico.
Aplomado falcon habitat characteristics	1996	Colegio de Postgraduados de Mexico, BRD, FWS	Understand the ecological characteristics of the Aplomado falcon's habitat in order to establish conservation programs.
Advance study seminar on natural resources of Mexico	1993-1995	NPS	Completed three workshops on understanding cultural and natural resources of Mexico.
WATER			
Colonias Wastewater Treatment Assistance Program (CWTAP)	1993-Ongoing	EPA, TWDB	Grants are provided to local governments and nonprofit water supply corporations for design and construction of wastewater collection and treatment facilities. Administered by TWDB.
Economically Distressed Areas Program (EDAP)	1989-Ongoing	TWDB	
Colonia Plumbing Loan Program (CPLP)	1991-Ongoing	EPA, TWDB	Loans are made available to low income colonia residents in designated border counties for residential plumbing improvements. Funds are administered at the local level.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Texas Colonias Enforcement Strike Force	1994-Ongoing	EPA, Texas Attorney General	This program supports the Texas Attorney General in the enforcement of state laws relating to colonia developments.
Study of barriers to colonias infrastructure	1993-1994	EPA, International City/County Management Association	A report on identifying barriers to achieving local government interest in colonias sanitation problems has been published.
Wellhead protection programs	1994-1997	EPA, TWDB	Programs in McAllen and Brownsville.
Colonias Assistance and Management Support Program (CAMSP)	1994-Ongoing	EPA, TWDB	This program provides overall management and coordination to eligible colonias in order to submit an application for financial assistance to implement needed drinking water and wastewater facilities improvements.
Circuit rider for technical assistance for public water systems along U.S.-Mexico border	1994-Ongoing	EPA, TNRCC	The objective of this program is to help utilities along the border to comply with state and federal regulations in a cost-effective manner. It also helps to ensure that water and wastewater utility services are maintained and expanded, where possible, by identifying financial resources and helping utilities access these resources.
Municipal onsite wastewater assistance program	1994-Ongoing	EPA, TWDB	Small communities received onsite technical assistance via a program for small community wastewater treatment plant operators that TWDB developed.
Binational wastewater operator training	1995-Ongoing	EPA, WEF	The first training session for wastewater treatment plant operators along the border has been conducted in a binational forum.
Binational water supply operator training	1995-Ongoing	EPA, American Water Works Association	The first training session on the requirements of the Safe Drinking Water Act has been conducted in a binational forum.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Rio Grande Toxics Baseline Study	1992-1993	EPA, IBWC, DOI, TNRCC, TDH, TPWD	Binational report completed in September 1994. While the study did not indicate that toxic contamination was widespread, several areas with elevated levels of toxic contamination were found, primarily below sister cities and in tributaries.
Rio Grande Toxics Study Follow-up	1995-Ongoing	EPA, IBWC, TNRCC	Field work completed. Report will help identify areas where additional water pollution control is needed.
Rio Grande-Rio Bravo Basin International Water Resources Assessment	1996-1999	BOR	Study outlined and now in the process of accessing transboundary data availability.
Lower Rio Grande Basin Study Amistad International Dam to Gulf of Mexico	1992-1995	BOR	A report was completed and released in December 1995.
Rio Grande-Rio Bravo Alliance	1995-Ongoing	Stakeholders throughout the Rio Grande Basin including EPA, TNRCC, Mexico, New Mexico and Colorado state and federal environmental entities, Tribal representation, nongovernmental organizations and other local stakeholders participants.	The Rio Grande Alliance had its first coordinating meeting July 15-16, 1996 in El Paso, Texas. This meeting included participants from throughout the Rio Grande Basin.
Rio Grande cities facilities planning	1995-Ongoing	EPA, IBWC	U.S. Section of the IBWC has procured an A/E firm to develop planning of wastewater facilities to control wastewater discharges from Mexico into the Rio Grande/Rio Bravo.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Nuevo Laredo Treatment Plant	1994-1996	CNA, COMAPA, Tamaulipas state government, IBWC	Construction of the treatment plant with a capacity of 1360 LPs was completed. Also the sewer system was expanded, and the collectors and pumping plant were rehabilitated and expanded.
Laredo, Texas water and wastewater improvements	1995- 1999	EPA, TWDB, Laredo	Planning complete. Design at 95 percent. FONSI in process.
Gulf of Mexico Program	1988-Present	EPA, USDA, NOAA, USFWS, USACE, FDA, MMS, Florida, Mississippi, Alabama, Louisiana, Texas, EPOMEX	Working to improve the flow of environmental information between U.S. and Mexico and responding to environmental problems in the Gulf of Mexico.
Rio Grande water quality monitoring: Middle Basin (Amistad Falcon Reservoir)	1996-1999	USGS, TNRCC	Developing monitoring plan. Sampling will start in 1997.
Evolution of bed-sediment chemistry in the Rio Grande River	1996-1997	USGS	Retrospective analysis prior to data collection.
Nonpoint Source Toxic Substances Project for Manadas Creek Watershed, Laredo	1996-1999	TNRCC, Laredo, USGS	Developing QA/QC framework documents outlining data collection, analytical methods and data management protocols.
Drinking water supply for the city of Matamoros	1995-1996	CNA	Construction will soon be completed to change the drinking water source of the city.
Drinking water supply for the city of Valle Hermosa (first stage)	1995-1996	CNA	Construction will soon be completed to change the drinking water source for the city.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Laredo, Texas, Jefferson and Chacon water and wastewater improvements	1995-Ongoing	EPA, TWDB, Laredo	Funds have been provided for planning, design and construction of water and wastewater improvements in Laredo, Texas. Planning has been completed. The design phase is 95 percent complete.
Anzalduas-Reynosa aqueduct	1993-1996	CNA	Construction of the Anzalduas-Reynosa aqueduct has been completed for the city's water supply.
Aquifer Storage and Recovery Study - Hueco Bolson	1995-1997	BOR	Awarded contract to investigate opportunities for groundwater recharge of Rio Grande excess flows.
ENVIRONMENTAL HEALTH			
Birth Defects Registry	Pilot began in 1994 in TDH Regions 6, 11 Expansion in 1997 to Regions 2,3,5, South 8,9,10	TDH, March of Dimes, CDC	Pilot Birth Defects Registry. Expansion of Birth Defects Registry. Statewide cluster investigation. Referral information services (Department case management - medical, social, financial). Folic Acid Prevention Asessment. Establishment and coordination of Scientific Advisory Committee on Birth Defects in Texas.
Dengue fever surveillance and interventions	1995-1996	TDH, CDE, University of Texas Medical Branch, UT School of Public Health, Cameron, Hidalgo and Webb counties local health departments	Human disease surveillance identified 7 indigenous cases. Mosquito surveillance found vectors in all counties of concern, but none resistant to pesticides. Survey of public found more than 80 percent with appropriate knowledge of Dengue.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Brownsville Leukemia Cluster	1993-Ongoing	TDH	Examined Leukemia and non-Hodgkins lymphoma incidence data for Brownsville and Cameron County residents for 1990-1991. No statistical excesses found. Updated leukemia incidence through 1992 for Cameron County. No statistical excess found.
South Texas Rabies Initiative	1994-Present	TDH, USDA, CDC, Canadian Government	Largest oral rabies vaccine distribution ever for two successive years. Establishment of South Texas Rabies Response Center in Laredo to increase public awareness of rabies and its prevention. Developmental work on safety and efficacy of the vaccine in the field. Apparent success in stopping the northward spread of canine rabies in Texas.
Binational TB Campaign	1995-Present	TDH, SSA, HHS, PAHO/ USMBHA, health departments of all 10 border states, private sector partners/medical associations	State-to-state TB Agreements signed between Texas-Tamaulipas and Texas-Chihuahua. Circulated draft of TB White Paper. Held Binational TB Symposium, February, 1996. Beginning initiatives for Internet communication and provider education.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
NTD Field Surveillance and Case-Control Study	1995-1996	TDH, CDC, EPA	Three years of surveillance data are complete. More than 60% of high risk women are taking folic acid. Case-control study for risk factors for NTD occurrence has been implemented.
Border Cancer Registry	Ongoing	TDH, CDC	Completed cancer incidence data collection and analysis for 18 border counties for 1990-1992. Continuing to collect incidence data for 1993 and forward. Report being published.
Border Environmental Health Survey	1996-1997	TDH, EPA, CDC	About 2,100 household surveys will be conducted along the Texas-Mexico border to collect data on household structure, general sanitation, health conditions, and potential sources of exposure to environmental contaminants.
Grupo Sin Fronteras	1995-Present	TDH, SSA, ISSSTE, IMSS, PEMEX	Increase availability to TB lab services. Increase supervised therapy. Increase referrals for contact investigation.
Binational Manager and Tracking and Referral System	1995-Present	TDH, EPCCHS Migrant Clinicians' Network	Under development. Toll-free access to TB information from anywhere in the U.S. or Mexico.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Texas Small Towns Environment Program (STEP)	1994-Present	TDH, TNRCC, Texas Dept. of Housing & Community Affairs, TGLO, TWDB	Interagency project to assist small communities to meet their water and wastewater needs through self-help/sweat-equity. Interagency workgroup. Initial thrust is in colonias along the Texas-Mexico border. Four current border projects; one in construction, three in various stages of design/planning /assessment. Newsletter.
Mercury poisoning prevention	1995-Present	TDH, PAHO/ USMBHA, CDC, ADHS, CDHS, NMDOH	Identified the source of exposure. Initiated a binational border wide effort to increase public awareness about the health hazards of the source. Conducting active surveillance of cases. Developing strategies for treatment of exposed individuals.
PM -10 and children's respiratory health	1995-1996	SCERP, UTEP, ITESM, EPA, Arizona State University	Determination of health effects on children of PM-10 and associated chemical components.
AIR			
Air monitoring in Laredo Texas and Nuevo Laredo, Tamaulipas	Ongoing	EPA, INE, TNRCC	In Laredo, monitoring for PM-10 and PAH is underway. Monitoring for ozone, CO, VOC, lead, arsenic, and meteorological data will be initiated in August of 1996. INE provided two PM-10 samplers for Nuevo Laredo.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Air monitoring in Brownsville, Texas and Matamoros, Tamaulipas	Ongoing	EPA, INE, TNRCC	A site monitors 0_3, CO, SO_2, PM-10, Pb, arsenic, VOCs, PAH, and meteorological conditions. INE has provided four PM-10 monitors to Matamoros.
Transboundary Air Monitoring Project, Cameron County, Texas	Ongoing	EPA, TNRCC	Conducted a pilot project in Brownsville to identify and evaluate the manner and extent to which valley residents are exposed to environmental pollutants. Examine extent of transboundary air pollution through monitoring or mobile, industrial, and agricultural activities and collection of meteorological data.
Air toxics monitoring in Hidalgo County, Texas	Ongoing	EPA, TNRCC	Adding air toxics monitoring equipment at two existing O_3 monitoring sites in Hidalgo County and scheduling mobile laboratory sampling in the border areas.
Air monitoring in Reynosa, Tamaulipas	Ongoing	INE	INE has provided five PM 10, one SO_2 monitors and two meteorological sites monitors.
HAZARDOUS and SOLID WASTE COOPERATIVE ENFORCEMENT and COMPLIANCE **(Please see Appendix 10 for additional solid and hazardous waste projects of U.S. state and local agencies)**			
Outreach and training to maquiladoras on regulatory requirements for transborder shipments of hazardous waste	1988-1993	EPA, SEDESOL, TNRCC, NMED, US and Mexican Customs, DOT, National Maquiladora Association, SCT, Cal-EPA, ADEQ	Six borderwide conferences were held to increase understanding by maquiladoras and U.S. parent companies of import/export regulations. Developed bilingual manual for the maquiladora industry.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Cleanup of the Alazana Canyon; clean closure of old open dumps; grant sanitary concession to SETASA; determine permanent solution for sanitary landfill vis I.P. (Nuevo Laredo)	1993-1994	SEDESOL, cities, SETASA	Drainage and improved hydrologic systems for the canyon; increased efficiency and general drainage for municipal sanitation; develop integrated solution for management and final disposition of sanitary landfills with I.P.
Preliminary environmental evaluation with regard to solid wastes (Matamoros and Reynosa)	1993	B.M., SEDESOL	Identificaiton of needs for solid waste infrastructure to preserve the environment.
Enforcement Task Force	Ongoing	TNRCC, EPA, PROFEPA, U.S. and Mexican Customs, U.S. DOT, TDPS	Pursuant to an EPA grant, TNRCC established a multiagency task force in Laredo and Brownsville to explore enforcement issues of the area.
Education and training	Ongoing	EPA, TNRCC	Pursuant to an EPA grant, TNRCC provides training to address the transboundary hazardous waste issues. TNRCC also established an information program and hot line for the public.
Enforcement of hazardous waste regulations using manifests and associated shipment data from HAZTRAKS, a binational computerized tracking system, to identify potential violators.	Ongoing	EPA, TNRCC	A number of enforcement cases have been filed (administrative and judicial).

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Inspections/investigations of hazardous waste transporters at key border crossings (e.g., weigh stations, transporter yards, hazardous waste warehouses) to find illegal shipments.	1993-Present	EPA, PROFEPA, TNRCC, U.S. and Mexican Customs, U.S. DOT, TDPS, TDH	Monitor the import/export of hazardous wastes through a cooperative multiagency initiative to determine if shipments conform to applicable laws and regulations.
Enforcement of Texas Community Right-to-Know Acts (TCRAs)	Ongoing	TDH	Conducting compliance inspections in Laredo, Texas of facilities subject to any of the three TCRAs. This is a special project based on the problems faced by Laredo as the principal port of entry from Mexico under NAFTA. Public Health Regions 8,9,10 and 11 also conduct these inspections along the rest of the border.
Hazardous waste enforcement	1995	TNRCC	Pursuant to an EPA grant, conducted 115 inspections of facilities which handle hazardous wastes imported from Mexico.
International bridge inspections	Ongoing	TNRCC	Pursuant to an EPA grant, conducted 55 international bridge inspections on hazardous waste shipments crossing the border.
U.S. Customs training course	Ongoing	TNRCC, U.S. and Mexican Customs, EPA	Pursuant to an EPA grant, TNRCC conducted 13 Customs training courses on regulations pertaining to the transboundary movement of hazardous wastes.
Multimedia Inspector Training	1995-Present	EPA, PROFEPA, CNA	EPA provided multimedia training to 47 Mexican inspectors from PROFEPA and CNA.
CONTINGENCY PLANNING AND EMERGENCY RESPONSE			
Organize workshop on innovative technology		EPA, ICMA	Grant to state of Texas, for $23,950 to organize a workshop similar to the ICMA workshop in Laredo-Nuevo Laredo.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Cross-training workshops	1996	TNRCC, DOT, TDH	Provided cross-training to inspectors from U.S. Customs, U.S. Border Patrol, TX DPS, TNRCC, various offices in several border cities, and Mexican agencies on the requirements of federal and state community right-to-know laws and on how to use information on material safety data sheets and container labels for personal protection. This program was run by TNRCC.
Grant to state of Texas to address environmentally sensitive areas		EPA, State of Texas	Grant to state of Texas, for $100,000 to assist in preparing a sister city plan and create a binational environmental plan to address environmentally sensitive areas in Laredo and Nuevo Laredo.
SARA Title III Workshop in Laredo, Texas	1996	EPA, TNRCC, TDH, Laredo Fire Department	Provided instruction on the requirements for and the completion of Tier Two chemical inventory reports to representatives from industry, ranches, various city departments, warehouses, and other members of the regulated community. The reports are required under both federal and state community right-to-know laws. The program was sponsored by EPA.
Subcommittee on Compliance Issues for Transporters and Storage Facilities	1996-Present	TX Office of the Attorney General, TDH, TX DOT, TNRCC, TDPS, TX Dept. Of Insurance, USDOT, OSHA, Laredo and local groups.	Provided review of the new ordinance for the city of Laredo on storage of hazardous materials in warehouses.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Subcommittee No. 3 Resources for Hazardous Materials Education, Public Awareness, and Prevention	1996-Present	TDH, TNRCC, TXDPS, TXRRC, OSHA, EPA, USDOT, Laredo and local groups	Have prepared outreach documents in English and Spanish for the public and regulated community on hazardous materials subjects. Work is ongoing on setting up five workshops along the border (Brownsville, McAllen, Laredo, Del Rio and El Paso) to educate the public and regulated community on hazardous materials issues. Work is also ongoing on a public outreach trade show on hazardous materials.
POLLUTION PREVENTION			
Video conference on Permanent Pollution Prevention Program (P4) broadcast through Monterrey Institute of Technology	1995-Ongoing	TNRCC, ITESM	A four-hour video broadcast was downlinked at 8 Mexican cities through the Monterrey Institute of Technology. Plans are developing for an extension of this P4 to downlink to 26 satellite campuses throughout Mexico to reach the maquiladora industries.
Technology transfer and capacity building on pollution prevention with PROFEPA	1995-Ongoing	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, Nuevo Leon	Joint partners site assessments and follow-up site visits are focused on determining opportunities to implement pollution prevention and clean technology for Mexican industrial facilities. These have resulted in reductions in wastes and air emissions and have also cumulatively saved facilities over a million dollars through pollution prevention.
Pollution prevention assistance to small business operations	1996	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, Nuevo Leon, and EDF	Demonstration of a model spray booth for training of operators in the auto and paint shop industry. El Paso and Ciudad Juarez receiving training on spray paint with low VOCs and recovery of solvents and recycling.

TABLE 8.3
PAST AND ONGOING PROJECTS - TEXAS -TAMAULIPAS

ACTIVITY	TIME FRAME	PARTNERS	ACCOMPLISHMENTS
Technical assistance to Mexican state environmental agencies	1995-Ongoing	EPA, TNRCC, PROFEPA offices in Chihuahua, Coahuila, Tamaulipas, Nuevo Leon	Continue capacity building with Mexican state and federal environmental agencies by providing training and technical assistance in the four Mexican states bordering Texas.
Solid waste recycling initiatives	1995-Ongoing	EPA	Solid waste and recycling conferences. The latest conference was held May 22-23, 1996 in Nuevo Laredo. Others in April and October 1995 and February and May 1996.
Pollution prevention curriculum conference for students and graduates in engineering	1995-Ongoing	EPA, TNRCC, ITESM, UT-Pan American, Monterrey Institute of Technology, University of Nuevo Leon	Conference was held November 1995 on development of a pollution prevention curriculum for students and graduates in engineering. Guideline chapters are under development and should be completed by October 1996. Another conference is being organized to further the curriculum on pollution prevention, to disseminate available information materials and exchange creative problem-solving approaches.
Development of the EP3 Program in Mexico under the Agency for International Development	1996-Ongoing	EPA, AID, INE	
Inventory of solid waste landfills	Ongoing	EPA, TNRCC	Pursuant to EPA grants, an inventory of active solid waste landfills along the border was conducted. Training on landfill design, operation and closure was provided to Mexican officials and landfill owner/operators.
Assessment of illegal dumps	Ongoing	EPA, TNRCC	TNRCC is evaluating the scope of illegal dump problems and assessing collection/disposal needs.

Objectives for the Next Five Years

Natural Resources

- Continue ongoing investigations of flora, wildlife, and aquatic habitats to improve management and protection programs for important fish and wildlife resources. Study feasible alternatives that promote the sustainable use of natural resources in the Laguna Madre and the entire border region.

- Protect, recover, and manage species in danger of extinction in the Texas-Tamaulipas border region including the jaguarundi and the ocelot.

- Promote biodiversity protection, conservation, and use programs in the Mexican border region and establish the necessary controlled production units as a strategy for restoring threatened and endangered species with the participation of the Rescue and Rehabilitation Center for Wild Species, in Tolchic, Tamaulipas.

- Identify joint areas of priority and link the BRD National Biological Information Infrastructure (NBII) with the development of the CONABIO biodiversity information system focusing on the Texas-Tamaulipas-Nuevo Leon-Coahuila-Chihuahua area as a pilot area.

- Establish a protected national area in the region of the Laguna Madre, Tamaulipas, for the conservation of aquatic migratory birds and residents of this habitat. Develop the activities necessary for their protection and a management program that considers the sustainable development of resources for the people that inhabit the surrounding area. Design strategies for the long-term financial self-sufficiency of these protected areas.

- Promote and conduct training courses, education, and projects on the conservation of protected natural areas and habitats of interest like the ecological corridor along the Rio Grande, Laguna Madre in Tamaulipas, the Padre Island Wildlife Reserve, and the Atascosa Laguna in Texas.

- The USDA Forest Service will provide a series of forest nursery workshops and training which focus on improvement of quality and quantity of seedling production, as well as reforestation efforts in places such as Tamaulipas border communities.

- Increase the number of forest nurseries and improve planting practices.

- Establish reforestation programs for the cities of Camargo, Ciudad Mier, Guerrero Viejo, Matamoros, Miguel Alemán, Nuevo Guerrero, Nuevo Laredo, Reynosa, Rio Bravo, San Fernando, and Valle Hermoso, and also their industrial parks and the riparian corridor of the Rio Grande.

- Characterize the levels of wastes dangerous for fish and wildlife resources in the Laguna Madre.

- Continue to monitor sources of marine debris on Padre Island, and water quality in Laguna Madre, Texas.

- Protect and manage the Kemp Ridley sea turtle by restoring its habitat.

- Characterize the plankton in the Laguna Madre, Texas.

- Conduct a baseline inventory of sea grasses in the Laguna Madre system.

- Establish a rural aquaculture program, training the residents in the area of aquatic uses with the available resources.

- Design and establish a contamination monitoring program in the coastal zone of Mexico for the determination of the current status and the general concentration of critical contaminants, that could result in regulations for the use of natural resources shared by both countries.

- Establish regulations for the import, export, and quality control of the aquatic organisms to be used in aquaculture, as well as fishery products.

- Carry out specialized studies in the area of aquaculture in order to define the resource management and utilization plans that would be implemented along the border.

- Develop a fish stocking program in the La Amistad Reservoir, under the Convention for the Use of Surface Waters.

Water

- Inherent in the efforts to protect surface and groundwater resources is the need to improve urban infrastructure associated with the supply of drinking water and the disposal of wastewater. In particular new treatment plants or the rehabilitation of existing facilities for the treatment of wastewater are needed in Reynosa and Matamoros. Recognizing the importance of the Rio Grande to sustainable development, the U.S. and Mexico will work together on a watershed-based analysis of drinking water and wastewater infrastructure needs for the cities, towns, and communities near the river. EPA and CNA will continue to work with the IBWC and BECC to facilitate the development of the Rio Grande Cities Facilities Planning projects.

- The TNRCC and EPA will continue to share information with CNA and other appropriate Mexican authorities regarding the creation of the Rio Grande Alliance, taking into consideration the concept of basin management in Mexico. U.S. and Mexican state and federal agencies will continue discussions regarding managing their ecosystem and watershed activities. Comprehensive planning for the Rio Grande watershed will help both governments develop solutions to identified water quality problems. Similar collaboration of efforts will be encouraged along of the rest of the border.

- The U.S. and Mexico will continue to work together to complete the ongoing Rio Grande water quality studies, begin analysis of the data, and evaluate the need for additional monitoring.

Environmental Health

- In-depth discussion of binational, geographic-specific five-year objectives have only commenced in earnest with the issuance of the Framework Document. The intent is to translate the overall environmental health objectives outlined in Chapter III into objectives, priorities, and projects specific for this region benefiting from further binational discussions and the input obtained from community outreach meetings.

Air

- The U.S. and Mexico will continue baseline air quality monitoring. As more data are developed, both countries will be able to assess current air quality, and develop a strategy to prevent these areas from deteriorating into nonattainment. As in other areas in the border region, the development of technical capacity with an increase in the quantity and quality of source inventories will allow for development of a strategy to improve air quality in the region. EPA will support continued short-term air toxics investigations by TNRCC in the border area, using the TNRCC mobile sampling lab.

Hazardous and Solid Waste

- Proper management, treatment, and disposal of hazardous and solid wastes, as well as compliance with regulations for transboundary shipments of hazardous wastes, will remain a priority for the Texas-Tamaulipas region. Continued cooperation among the state and local offices will focus on:
  - ongoing information and technology transfer;
  - cooperative training;
  - building laboratory sampling and analysis capabilities;
  - developing recyclables markets; and
  - using and improving HAZTRAKS as a tracking and compliance tool.
- One of the principal actions will be to improve waste management practices in the Texas-Tamaulipas region and promote solid and hazardous waste minimization and recycling. This will be accomplished by:
  - developing partnerships with industry to encourage waste minimization and safe material management;
  - providing site-specific compliance and technical assistance on an as-needed basis;

- training government officials, community leaders, and industry on waste reduction and pollution prevention.

Contingency Planning and Emergency Response

➤ Both governments will develop state and local abilities to be prepared for and to respond to chemical emergencies in the areas of Nuevo Laredo-Laredo, Reynosa-McAllen, and Matamoros-Brownsville. This will be accomplished through the Joint Response Team which involves federal, state and local agencies with responsibilities for dealing with environmental emergencies. Responsibilities of the Joint Response Team include implementation of the Joint Contingency Plan in the mentioned sister cities for the creation and promotion of CLAMs , the creation of a communication center which responds to emergencies and is properly equipped, training of personnel involved in chemical emergency response, communication to the public, and other activities.

Cooperative Enforcement and Compliance

➤ The Cooperative Enforcement and Compliance Workgroup will promote the establishment of a subgroup for the Texas-Tamaulipas region, which will have the responsibility of meeting the objectives referred to in Chapter III.

➤ The PROFEPA inspection program expects to carry out 3,700 inspections between 1996 and 2000 to monitor regulatory environmental compliance in the state of Tamaulipas.

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APPENDIX 1

A Brief Description of U.S.-Mexico Border Environmental Agreements and International Institutions

International Boundary and Water Commission - IBWC

The United States and Mexico signed a treaty in 1889 creating the International Boundary Commission (IBC). The mandate of the IBC was to resolve problems of boundary demarcation between the United States and Mexico caused by changes in the courses of the Colorado and Rio Grande rivers. In 1944, the two nations signed the Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande (the Water Treaty) transforming the International Boundary Commission into the International Boundary and Water Commission (IBWC). The Water Treaty extended the Commission's purview to include maintaining the land boundary and apportioning the waters in the aforementioned rivers. It also enhanced the Commission's authority to address issues regarding water quality, conservation, and use along the boundary. In addition to these duties, the IBWC was given authority to deal with border water sanitation issues through projects mutually agreed upon by the United States and Mexico. These agreements are "Minutes" of the IBWC. Some of the most significant Minutes on border sanitation problems include the following:

- IBWC Minute No. 294 (1995) - Facilities planning program for the solution of border sanitation problems
- IBWC Minute No. 289 (1992) - Observation of the quality of the waters along the U.S.-Mexico border
- IBWC Minute No. 288 (1992) - Conceptual plan for the long-term international solution to the border sanitation problem of the New River in Mexicali, Baja California - Calexico, California
- IBWC Minute No. 283 (1990) - Conceptual plan for the international solution to the border sanitation problem in Tijuana, Baja California - San Diego, California
- IBWC Minute No. 279 (1989) - Agreement on joint projects to improve the water quality of the Rio Grande in Nuevo Laredo, Tamaulipas - Laredo, Texas.

1983 United States-Mexico Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area - La Paz Agreement

In 1983, in La Paz, Baja California, the United States and Mexico signed the Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area, otherwise known as the "La Paz Agreement" or the "1983 Border Environmental Agreement." This document established a framework for cooperation between the two countries to prevent, reduce, and eliminate sources of air, water, and land pollution in the zone extending 100 kilometers along each side of the international boundary. The La Paz Agreement creates a procedure for establishing annexes which facilitate cooperation on specific environmental issues. Currently, there are five such annexes.

Annex I provides for the construction and operation of the Tijuana-San Diego wastewater treatment facilities. Activities related to this project are carried out in coordination with the IBWC. This annex was signed by the United States and Mexico on July 18, 1985.

Annex II authorizes the establishment of the Inland Joint Response Team (JRT) to respond to accidental spills of hazardous substances in the border area. It was signed on July 18, 1985, and is complemented by the 1988 Joint U.S.-Mexico Contingency Plan for Accidental Releases of Hazardous Substances Along the Border.

Annex III establishes procedures governing the transboundary shipment of hazardous wastes and hazardous substances between the U.S. and Mexico. Annex III was signed on November 12, 1986.

Annex IV requires certain copper smelters in the border area to comply with specific limits on emissions, contains reporting requirements, and provides for the exchange, between the U.S. and Mexico, of emissions and compliance monitoring data on copper smelters in their respective border states. This annex was signed in January 1987.

Annex V calls for an assessment of the causes of, and solutions to, binational urban air quality problems in the border area. Annex V was signed on October 3, 1989. The annex was amended in May 1996 to include the formation of the Joint Advisory Committee for Air Quality Improvement for the El Paso-Ciudad Juarez-Dona Ana County air basin.

Originally, four binational Workgroups of technical experts were established pursuant to the La Paz Agreement to implement the Agreement and its annexes. In 1991, two new Workgroups were created. The six Workgroups are Water, Hazardous Waste, Air, Contingency Planning and Emergency Response, Cooperative Enforcement and Compliance, and Pollution Prevention. The Water Workgroup works closely with the IBWC and the Border Environmental Cooperation Commission (BECC) to establish binational funding priorities for wastewater treatment plants and drinking water facilities in the border area. As a result of the development of the Border XXI Program, three new Workgroups have been formed: Information Resources, Natural Resources, and Environmental Health.

Work carried out under the La Paz Agreement is coordinated by two National Coordinators: the International Affairs Coordinator in SEMARNAP and the Assistant Administrator for International Activities of EPA. The National Coordinators meet at least once a year to review the progress on implementation of the Agreement and environmental cooperation activities between the two countries.

Integrated Environmental Plan for the U.S.-Mexican Border Area -IBEP

The *Integrated Environmental Plan for the Mexican-U.S. Border Area Environmental Plan, First Stage 1992-94*, commonly referred to as the Integrated Border Environmental Plan (IBEP) grew out of a meeting between the President of Mexico and the President of the United States on November 27, 1990, in Monterrey, Mexico, on the potential economic benefits and environmental effects of trade liberalization between the two countries. The IBEP reflected the idea that long-term economic growth is not possible without environmental protection and long-term environmental protection is not possible without economic growth. The goal of the Plan was to protect human health and natural

ecosystems along the border. The Plan had four specific objectives: (1) to strengthen the enforcement of environmental laws; (2) to reduce pollution through new initiatives; (3) to increase cooperative planning, training and education; and (4) to improve the understanding of border environmental problems.

The North American Free Trade Agreement - NAFTA

The North American Free Trade Agreement contains a number of environmental provisions and an additional trilateral environmental agreement was negotiated to supplement it. Subsequently, a bilateral agreement was signed to address the deficiencies in water and waste infrastructure in the border area.

The North American Agreement on Environmental Cooperation - NAAEC

The North American Agreement on Environmental Cooperation (NAAEC) was signed by the United States, Canada, and Mexico on September 13, 1993 and entered into force with the NAFTA trade agreement on January 1, 1994, to promote sustainable development through mutually supportive environmental and economic policies. The Commission for Environmental Cooperation (CEC) located in Montreal was created under the NAAEC to protect, conserve, and improve the environment through increased cooperation among the Parties and increased public participation.

The CEC is comprised of three groups -- the Council, the Secretariat and the Joint Public Advisory Committee. The Council is the governing body and is composed of a cabinet level environment official from each of the three countries. The Secretariat in Montreal has a staff of approximately thirty professionals drawn from the three countries, who provide technical and administrative support to the Council. Finally, the Joint Public Advisory Committee (JPAC) reflects the Commission's commitment to public participation. The fifteen JPAC members, five from each country, are citizens who advise the Council on any matter within the scope of the NAAEC.

In the first two years of operation, the CEC has begun work on an impressive list of 38 environmental projects under its cooperative work program, the Annual Program and Budget. The NAFTA parties are seeking solutions to a number of issues of trilateral significance for the first time, focusing initially on four major themes: environmental conservation, protecting human health and environment, enforcement cooperation and law, and information and public outreach.

The CEC reports annually to the public on the implementation of the Annual Program and Budget, as well as the success of the Parties in meeting their obligations under the agreement. The Parties decided to highlight environmental enforcement activities in a thirty-page annex of the 1995 Annual Report. Enhanced levels of cooperation on enforcement issues are occurring through a CEC permanent working group, which has agreed to participate in a range of activities from technical assistance and cataloguing training courses and enforcement officials to exploring alternative approaches to compliance.

The Secretariat also periodically reports on the state of the environment of the three countries and has the authority to prepare a factual record on any matter within the scope of the Annual Program and Budget, unless the matter is related to a country's failure to enforce its domestic environmental laws, or unless the Council objects to a factual record within thirty days of being notified. Finally, the Secretariat may also prepare a factual record in response to a public submission alleging that a NAFTA party is failing to effectively enforce its environmental law, as long as the submission meets certain criteria and two thirds of the Council agree that the factual record may be prepared.

The CEC is designed to support and augment NAFTA and its institutions, such as the NAFTA Free Trade Commission. The CEC is a primary point of public inquiry and point for receipt of public comments regarding NAFTA's environmental objectives. It may also assist the Free Trade Commission in dispute resolution, dispute avoidance, and other environment-related matters.

U.S.-Mexico Agreement on the Border Environment Cooperation Commission and the North American Development Bank

The second environmental agreement negotiated to augment the NAFTA is the U.S.-Mexico Agreement Concerning the Establishment of a Border Environment Cooperation Commission and the North American Development Bank ("BECC-NADBank Agreement"). Like the trinational NAAEC, it entered into force together with NAFTA on January 1, 1994. The BECC-NADBank Agreement targets certain environmental problems in the border region in order to remedy transboundary environmental or health problems. It establishes two institutions to address such environmental issues.

The Border Environment Cooperation Commission - BECC

The Border Environment Cooperation Commission (BECC), located in Ciudad Juarez, Mexico, helps formulate effective solutions to environmental problems in or near the border region by working with state agencies, local communities, and other project sponsors to develop and implement environmental infrastructure projects. The Agreement defines BECC's project priorities as water, wastewater, municipal solid waste, and related matters. The BECC determines whether a project that meets certain technical, financial and environmental criteria should be certified as eligible for North American Development Bank financing. Although the BECC does not develop or manage projects itself, it may provide technical, environmental, and financial expertise to all phases of a project.

The BECC has a staff of professionals from both the United States and Mexico, who work with the engineering staff of the IBWC and private contractors to provide a full range of project services including engineering, design, project siting, environmental analysis, and oversight of construction and operation. The principal professional staff members are a General Manager and a Deputy General Manager, who must be of different nationalities.

The BECC is governed by a Board of Directors. The Board of Directors is comprised of two *ex officio* members and three appointees from both Mexico and the United States, for a total of ten members. The two nations alternatively select a chairperson who serves a one-year term and may be reappointed. For the United States, the two *ex officio* members are the Administrator of the EPA and the U.S. Commissioner of the IBWC. For Mexico, the two *ex officio* members are the Secretary of SEMARNAP and the Mexican Commissioner of the IBWC. The three other members from each country must have expertise in environmental planning, economics, engineering, finance, "or other related matters." One member from each country must be a representative of a border state and one, a representative of a locality in the border region. The third position from each country is filled by someone who is a resident of the border region.

The Board of Directors consults with an Advisory Council. The Advisory Council plays a consultative role regarding general guidelines, criteria applied to projects, and other aspects of the certification process and of the work of the BECC. It must meet at least quarterly.

The Advisory Council consists of nine members from the United States and nine from Mexico, totaling 18 members serving two-year terms. Each nation chooses, from among its members, one cochair to lead the Council. The Agreement requires that six of the nine members from the U.S. be residents of U.S. border states, with at least four states represented. These six members must represent states, localities, or local community groups. The three remaining members of the Advisory Council from the United States are selected from the public. One must represent a scientific, professional, business, nonprofit or public interest organization or association.

The Agreement requires that six of Mexico's nine Advisory Council members be residents of Mexican border states, one from each state. These six people must represent states, localities, or local community groups. The three remaining members are drawn from the general public. One must represent a scientific, professional, business, nonprofit or public interest organization or association.

In September 1995, the BECC adopted its Project Submission Guidelines and Certification Criteria, and has used them to certify eight water-related infrastructure projects in Texas, California, Arizona, Tamaulipas, Sonora, and Baja California, as of September 1996. The BECC has also adopted rules of procedure and certification criteria, instituted an extensive outreach program, and initiated development of a technical assistance program.

The North American Development Bank - NADBank

The second institution created by the Border Environment Cooperation Agreement is the North American Development Bank (NADBank), located in San Antonio, Texas. The NADBank's purpose is to arrange for public and private investment in environmental infrastructure projects certified by the BECC. The NADBank is capitalized and governed equally by Mexico and the United States. It uses 90 percent

of its capital to leverage approximately $2 billion or more of private funds in capital markets in order to finance construction of border environmental projects through bond and other financial instruments.

Its binational Board of Directors consists of three *ex officio* members from both Mexico and the United States, for a total of six members. The members from the United States are the Secretary of State, the Secretary of the Treasury, and the Administrator of the EPA. The three Mexican *ex officio* members are the Secretary of Finance, Secretary of SEMARNAP, and the Secretary of Trade and Industry (SECOFI).

The nationality of the chairperson, who is chosen from among the six *ex officio* members, alternates between the two countries. The chairperson serves a one-year term. The Board of Directors must meet at least annually, and at least one meeting a year must be open to the public.

The NADBank's principal professional staff members are a Manager and Deputy Manager, who are of different nationalities.

The NADBank adopted its financing criteria in December 1995, and will use them to consider BECC-certified projects for financing.

Agreements Governing Natural Resources

Cooperation between the U.S. and Mexico in the areas of species and ecosystems conservation has its foundation in the following agreements:

- Convention between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Mammals, signed 1936, amended 1972.
- Mexico-U.S. Gulf of Mexico-U.S. Pacific, Cooperative Fisheries Program, 1983.
- Agreement between the Secretary of Agriculture and Hydraulic Resources (SARH) and the U.S. Department of Agriculture to facilitate information exchange and sustainable forestry development, 1984.
- U.S./Mexico/Canada Tripartite Agreement on the Conservation of Wetlands and Their Migratory Birds, signed 1988; modified in 1994 to include the North American Waterfowl Management Plan.
- Letter of Intent on Scientific Investigation between SARH's Subsecretariat for Forestry and Wildlife in Mexico, and the U.S. Department of Agriculture's U.S. Forest Service, 1992.
- Supplemental Agreement on Scientific and Technical Cooperation on Forest Matters between SARH's Subsecretariat for Forestry and Wildlife, and the U.S. Department of Agriculture's U.S. Forest Service, 1993.

- Memorandum of Understanding between the U.S. National Park Service and the National Institute of Ecology, 1994.

- Memorandum of Understanding to Realize Cooperative Scientific and Technical Actions between the National Commission for the Understanding and Use of Biodiversity (CONABIO) and the U.S. Biological Service, 1995.

- Memorandum of Understanding to Establish the Canada/Mexico/United States Trilateral Committee for Wildlife, Plants, and Ecosystem Conservation and Management, 1996 (replaces the Joint Committee of 1995 and the Tripatriate Committee of 1988).

- Memorandum of Understanding between USGS and INEGI on border map, digital spatial information database in the El Paso-Juarez area, 1992.

- Memorandum of Understanding between USGS and the National Autonomous University (UNAM) in Mexico on cooperative geoscience research, hydrology, geology and mapping sciences, 1994.

- Memorandum of Understanding between U.S. National Park Service and SEDESOL on cooperation in management and protection of national parks and other protected natural and cultural sites, 1988.

- U.S. Fish and Wildlife Service and SEDESOL Memorandum of Understanding on cooperation establishing the Joint Commission on Wildlife Conservation, 1984.

- Agreement to prevent and fight forest fires between the border states of Sonora and Arizona, signed by SARH and USDA, 1988.

Multilateral Agreements

- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), signed by the U.S. in 1973 and by Mexico in 1991. CITES establishes a worldwide system of import and export regulations to prevent the overexploitation of plants and animals listed in the three appendices to the Convention.

- Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere. Under this 1940 treaty, the governments of Mexico, United States, and 16 other American republics expressed their wish to "protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds" and to protect regions and natural objects of scientific value.

- Convention on Wetlands of International Importance Especially Waterfowl Habitats, 1973. This Convention maintains a list of wetlands of international importance and works to encourage the wise use of all wetlands in order to preserve the ecological characteristics from which wetland values derive.

APPENDIX 2

Directory of Contacts

National Coordinators

U.S.	Mexico
William A Nitze Assistant Administrator Office of International Activities U.S.EPA 401 M Street, SW Washington, DC 20460 phone: (202) 260-4870 fax: (202) 260-4470	Jose Luis Samaniego Leyva Coordinador de Asuntos Internacionales SEMARNAP Periferico Sur 4209, Fracc. Jardines en la Montaña 14210, Tlalpan, DF phone: (525) 628-0650 fax: (525) 628-0653
Contact: Pam Teel phone: (202) 260- 4896 fax: (202) 401-0140 e-mail: teel.pam@epamail.epa.gov	**Contacts:** Abraham Nehmad or Javier Warman phone: (525) 628-0652 fax: (525) 628-0653

U.S. EPA Environmental Attache Office - U.S. Embassy, Paseo de la Reforma 305, 06500 Mexico, D.F.
Contact: Lorry Frigerio or Karen Danart - phone: (525) 211-0042, ext. 3595, fax: (525) 208-6541

Border XXI Workgroup Cochairs and Contacts

Natural Resources Workgroup

U.S.	Mexico
Cochair: Nick Palacios Department of the Interior Bureau of Reclamation 300 E. 8th Street, Room 801 Austin, TX 78701 phone: (512) 916-5641	**Cochair:** Javier de la Masa Coordinador de Areas Naturales Protegidas INE-SEMARNAP Ave. Revolución1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3334
Contact: Susan Lieberman Department of the Interior MIB 4429 1849 C Street NW Washington, DC 20240 phone: (202) 208-5160	**Contacts:** Celia Pigueron or Pia Gallina INE-SEMRNAP phone: (525) 624-3338 Ave. Revolución1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3336 or (525) 624-3338

Water Workgroup

U.S.	Mexico
Cochair: William Hathaway Director, Water Quality Protection Division U.S.EPA Region 6 (6-WQ) First Interstate Bank Tower at Fountain Place 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733	**Cochair:** Ing. Próspero Ortega Subdirector General de Construcción CNA Insurgentes Sur No. 2140, 1er piso Colonia Ermita, San Angel México City, DF CP 01070 phone: (525) 661-6060 or 237-4074 fax: (525) 237-4132
Contacts: Oscar Cabra U.S.EPA Region 6 (6-WQ) First Interstate Bank Tower at Fountain Place 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733 phone: (214) 665-2718 Doug Eberhardt (U.S. EPA Region 9) phone: (415) 744-1280 e-mail: eberhardt.doug@epamail.epa.gov	**Contact:** Ing. Jaime Tinoco Rubí Coordinador de Asuntos Fronterizos CNA Insurgentes Sur 1806 Mezzanine Col. Florida México, DF CP 01030 phone: (525) 229-8650, -8651, or -8652 fax: (525) 229-8353

Environmental Health Workgroup

U.S.	Mexico
Cochairs: Hal Zenick U.S. EPA (87) National Health and Environmental Effects Research Laboratory Research Triangle Park, NC 27711 phone: (919) 541-2283 fax: (919) 541-4201 Richard Walling Director, Office of the Americas and the Middle East Office of International and Refugee Health U.S. Department of Health and Human Services Room 18-75, Parklawn Building Rockville, MD 20857 phone: (301) 443-4010 fax: (301) 443-6288 e-mail: rwalling@osophs.ssw.dhhs.gov	**Cochairs:** Dr. Gustavo Olaiz Fernández Director General de Salud Ambiental Secretaría de Salud San Luis Potosí No. 192, Piso 4 Colonia Roma CP 06700 phone: (525) 584-6529 or 584-6745 fax: (525) 584-5260 Adrián Fernández Bremauntz Director General de Gestión e Información Ambiental INE-SEMARNAP Ave. Revolución 1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3456 fax: (525) 624-3584
Contact: Yolanda Banks Anderson, Ph.D. Toxicologist, GS-0415-12/05 National Health and Environmental Effects Research Laboratory U.S. Environmental Protection Agency (MD-87) Research Triangle Park, NC 27711 phone: (919) 541-0479 fax: (919) 541-0317 e-mail: anderson@herl45.herl.epa.gov	**Contact:** Dra. Rosalba Rojas Secretaría de Salud San Luis Potosí No. 192, Piso 4 Colonia Roma, México, CP 06700 phone: (525) 584-6160

Air Workgroup

U.S.	Mexico
Cochair: David Howekamp Division Director Air Division U.S. EPA Region 9 (A-1) 75 Hawthorne Street San Francisco, CA 94105	**Cochair:** Adrián Fernández Bremauntz Director General de Gestión e Información Ambiental INE-SEMARNAP Ave. Revolución 1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3456 fax: (525) 624-3584
Contacts: Bill Jones U.S. EPA Region 9 (A-1) 75 Hawthorne Street San Francisco, CA 94105 phone: (415) 744-1283 fax: (415) 744-1072 e-mail: jones.bill@epamail.epa.gov Mathew Witosky (EPA Region 6) phone: (214) 665-8015 e-mail: witosky.mathew@epmail.epa.gov	**Contact:** Dr. Victor Hugo Páramo INE-SEMARNAP Ave. Revolución 1425 Col. Tlacopac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3450 or 624-3451 fax: (525) 624-3584

Hazardous and Solid Waste Workgroup

U.S.	Mexico
Cochair: Jeff Scott Deputy Division Director Waste Management Division U.S. EPA Region 9 (H-2) 75 Hawthorne Street San Francisco, CA 94105	**Cochair:** Jorge Sánchez Gómez Director General Materiales, Residuos y Actividades Riesgosas INE
Contacts: Heidi Hall U.S. EPA Region 9 (H-2) 75 Hawthorne Street San Francisco, CA 94105 phone: (415) 744-1284 fax: (415) 744-1072 e-mail: hall.heidi@epamail.epa.gov Bonnie Romo (EPA Region 6) phone: (214) 665-8323 e-mail: romo.bonnie@epamail.epa.gov	**Contact:** Ing. Luis Wolf INE Av. Revolución 1425, Nivel 12 Col. Campestre, San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3423 fax: (525) 624-3586 e-mail: RTN@0488CRTN.NET.MX

Contingency Planning and Emergency Response Workgroup

U.S.	Mexico
Cochair: Mr. Jim Makris U.S. EPA (5101) 401 M Street, SW Washington, DC 20460 phone: (202) 260-8600 fax: (202) 260-7906 e-mail: makris.jim@epamail.epa.gov	**Cochair:** Eduardo Jiménez López Director General de Planeación y Coordinación Procuraduría Federal de Protección al Ambiente Periférico Sur 5000, Piso 4 Col. Insurgentes Cuicuilco México, DF CP 04530 phone: (525) 528-5482, 528-5483 fax: (525) 666-9452
Contacts: Ms. Kim Jennings U.S. EPA (5101) 401 M Street, SW Washington, D.C. 20460 phone: (202) 260-5046 fax: (202) 260-7906 e-mail: jennings.kim@epamail.epa.gov Fendol Chiles (EPA Region 6) phone: (214) 665-2283 Kathleen Shimmin (EPA Region 9) phone: (415) 744-2216	**Contact:** Jaime E. García Sepúlveda Director of Clasificación de Zonas de Riesgo Ambiental Procuraduría Federal de Protección al Ambiente Periférico Sur 5000, Piso 4 Col. Insurgentes Cuccilco México, DF CP 04530 phone: (525) 666-9450 fax: (525) 666-9452

Environmental Information Resources Workgroup

U.S.	Mexico
Cochair: Nora McGee U.S. EPA Region 9 (P-1) 75 Hawthorne Street San Francisco, CA 94105 e-mail: McGee.Nora@epamail.epa.gov	**Cochair** Adrián Fernández Bremauntz Director General de Gestión e Información Ambiental INE-SEMARNAP Ave. Revolución 1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3456 fax: (525) 624-3584
Contacts: Carmen Maso U.S. EPA Region 9 (P-5-2) 75 Hawthorne Street San Francisco, CA 94105 phone: (415) 744-1750 fax: (415) 744-1474 e-mail: maso.carmen@epamail.epa.gov David Parrish (EPA Region 6) phone: (214) 665-8352 e-mail: parrish.david@epamail.epa.gov	**Contact:** Rolando Ríos Aguilar Director de Información Ambiental INE-SEMARNAP Ave. Revolución 1425 Col. Tlacopac- San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3454

Pollution Prevention Workgroup

U.S.	Mexico
Cochairs: Sam Coleman Director, Compliance Assurance and Enforcement Division U.S.EPA Region 6 (6-EN) First Interstate Bank Tower at Fountain Place 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733	**Cochair:** Adrián Fernández Bremauntz Director General de Gestión e Información Ambiental INE-SEMARNAP Ave. Revolución 1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3456 fax: (525) 624-3584
Contacts: Joy Tibuni U.S.EPA Region 6 (6EN-XP) First Interstate Bank Tower at Fountain Place 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733 phone: (214) 665-8036 Chris Reiner (EPA Region 9) phone: (415) 744-2096 e-mail: reiner.chris@epamail.epa.gov	**Contact:** Luis Sánchez Cataño INE Ave. Revolución 1425 Col. Tlacapac-San Angel Delegación Alvaro Obregón México, DF CP 01040 phone: (525) 624-3570

Cooperative Enforcement and Compliance Workgroup

U.S.	Mexico
Cochair: Michael Alushin Director of the EPA International Enforcement and Compliance Division U.S.EPA (MC-2254-A) 401 M Street SW Washington, DC 20460	**Cochair:** Carlos Silva Murillo Director General de Asistencia Técnica e Industrial Procuraduría Federal de Protección al Ambiente Subprocuraduría de Verificación Normativa Blvd Pípila No. 1, Tecamachalco Nacaulpan, Estado de México, CP 53950
Contacts: Lawrence Sperling U.S.EPA (MC-2254-A) 401 M Street SW Washington, DC 20460 phone: (202) 564-7141 fax: (202) 564-0073 Efren Ordoñez (EPA Region 6) phone: (214) 665-2181 e-mail: ordonez.efren@epamail.epa.gov John Rothman (EPA Region 9) phone: (415) 744-1353 e-mail: rothman.john@epamail.epa.gov	**Contact:** Víctor Valle Procuraduría Federal de Protección al Ambiente Subprocuraduría de Verificación Normativa Blvd Pípila No. 1, Tecamachalco Nacaulpan, Estado de México, CP 53950 phone: (525) 294-5720 fax: (525) 589-4398

International Institutions

Border Environment Cooperation Commission (BECC)
Roger Frauenfelder, General Manager
Luis R. Dominguez, Deputy General Manager
Blvd. Tomás Fernández No 7940
Apartado Postal 3114-J
Ciudad Juárez, Chihhuahua, México, CP 32470
phone: (52 16) 29-23-95
fax: (52 16) 29-23-97

U.S. Postal Address:
P.O. Box 221648
El Paso, TX 79913

Commision for Environmental Cooperation (CEC) Seceretariat
393 Rue Saint Jacques Ouest
Bureau 200
Montreal, Quebec H2Y1N9
phone: (514) 350-4300
fax: (514) 350-4314

International Boundary and Water Commission (IBWC)
Mexican Commissioner Arturo Herrera Solis
Avenida Universidad No. 2180, Zona Chamizal
Sucursal "D," Apartado Postal No. 1612
Ciudad Juarez, Chihuahua, México
phone: (52 16) 13-73-11
fax: (52 16) 13-99-43

United States Commissioner John M. Bernal
4171 North Mesa Street, Suite C-310
El Paso, TX 79902
phone: (915) 534-6677
fax: (915) 534-6680

North American Development Bank (NADBank)
Alfredo Phillips O., Managing Director
Victor Miramontes, Deputy Managing Director

Contact: Annie Alvarado
Community and Governmental Officer
700 N. St. Mary's Suite 1950
San Antonio, TX 78205
phone: (210) 231-8000
fax: (210) 231-6232

Regional Contacts for the United States

EPA Regional Offices

Gina Weber U.S.-Mexico Border Coordinator U.S.EPA Region 6 (6-XA) First Interstate Bank Tower at Fountain Place 1445 Ross Avenue, Suite 1200 Dallas, TX 75202-2733 phone: (214) 665-2200 fax: (214) 665-2118 e-mail: weber.gina@epamail.epa.gov	John Hamill U.S.-Mexico Border Coordinator U.S.EPA Region 9 (RA) 75 Hawthorne Street San Francisco, CA 94105 phone: (415) 744-1168 fax: (415) 744-1072 e-mail: hamill.john@epamail.epa.gov

EPA Border Offices

Marvin Waters Director El Paso U.S-Mexico Border Liaison Office EPA Region 6 4050 Rio Bravo, Suite 100 El Paso, TX 79902 phone: (915) 533-7273 or (800) 334-0741	Dave Fege San Diego U.S-Mexico Border Liaison Office EPA Region 9 610 West Ash Street San Diego, CA 92101 phone: (619) 235-4765 or (800) 334-0741 fax: (619) 235- 4771 e-mail: fege.dave@epamail.epa.gov

Regional Contacts for Mexico

SEMARNAP District Officers (Delegados) and Sub-officers for Environment (Sub-delegados)

Baja California

Lic. Fernando Castro Trenti, Delegado Av. Madero No. 537, entre Morelos y México Zona Centro 21110 Mexicali, BC phone: (52 65) 52 49 86 fax: (52 65) 52 49 98	Ing. Fernando Calzada Béjar, Subdelegado de Medio Ambiente Av. Madero No. 537, entre Morelos y México Zona Centro 21110 Mexicali, BC phone: (52 65) 52 49 87

Sonora

Lic Ernesto Gándara Camou, Delegado Centro de Gobierno Edificio Hermosillo 2º Nivel 83270 Hermosillo, Son. phone: (52 62) 13 52 73 or (52 62) 13 52 61 fax: (52 62) 13 52 59	Biol. César Catalán Martínez Subdelegado de Medio Ambiente Centro de Gobierno Edificio Hermosillo 2º Nivel 83270 Hermosillo, Son. phone: (52 62) 13 52 29

Chihuahua

Sr. Manuel Llaneza Fernández, Delegado Av. de las Américas No. 300-B. Cuarta Ampliación Colonia San Felipe 31240 Chihuahua, Chih. phone: (52 14) 13 95 27 or (52 14) 13 15 47 fax: (52 14) 13 48 55 or (52 14) 13 47 75	Ing. Luis R. Córdova Chávez, Subdelegado de Medio Ambiente Av. de las Américas No. 300-B. Cuarta Ampliación Colonia San Felipe 31240 Chihuahua, Chih. phone: (52 14) 13 99 19 fax: (52 14) 13 47 75

Coahuila

Lic. R. Agustín Ramos Arizpe, Delegado Blvd. Venustiano Carranza No. 2454-2^0 Piso Colonia República Oriente 25280 Saltillo, Coah.	Ing. Ignacio Ruiz Castro, Subdelegado de Medio Ambiente Blvd. Delegadoenustiano Carranza No. 2454-2^0 Piso Colonia República Oriente 25280 Saltillo, Coah. phone: (52 84) 16 74 33 or (52 84) 16 74 35 fax: (52 84) 16 08 38

Nuevo Leon

Lic. Carlos Tercero Romero García, Delegado Av. Benito Juárez y Corregidora Palacio Federal 1er Piso 67100 Guadalupe, NL phone: (52 8) 3 55 07 21 or (52 8) 3 55 02 41 fax: (52 8) 3 55 20 51	Biol. Carlos Contreras Treviño, Subdelegado de Medio Ambiente Av. Benito Juárez y Corregidora Palacio Federal 1er Piso 67100 Guadalupe, NL phone: (52 8) 3 55 59 11 or (52 8) 3 54 97 68

Tamaulipas

Biol. Víctor Zamora Domínguez, Delegado Av. Avila Camacho No. 310, Esq. López Rayón Colonia Vergel 89150 Tampico, Tamps. phone: (52 12) 13 38 73, (52 12) 13 60 16, or (52 12) 13 61 95 fax: (52 12) 13 57 37	Ing. Ignacio Ruiz Castro, Subdelegado de Medio Ambiente Av. Avila Camacho No. 310, Esq. López Rayón Colonia Vergel 89150 Tampico, Tamps. phone: (52 131) 5 03 46

PROFEPA District Officers (Delegados)

Ing. Fco. Antonio Octavio Sandoval Sánchez
Delegado del Estado de Baja California
Lic. Alfonso García González No. 555
Col. Profesores Federales
21370 Mexicali, BC
phone: (52 65) 61 78 84 or
(52 65) 61 74 91
fax: (52 65) 61 79 30

Biol. Martha Patricia Celis Salgado
Delegada del Estado de Sonora
Revolución No. 111
Col. Centro
83290 Hermosillo, Son.
phone: (52 62) 17 46 98 or
(52 62) 13 28 38
fax: (52 62) 13 28 78

Biol. Ma. del Pilar López Marco
Delegada del Estado de Chihuahua
Thomás Alva Edison No. 1510 Norte,
esquina con Malecón
Col. Hidalgo
32300 Ciudad. Juárez, Chih.
phone: (52 16) 11 01 66 or
(52 16) 11 01 67
fax: (52 16) 11 01 98

Ing. Rogelio Cepeda Sandoval
Delegado del Estado de Coahuila
Calle Victoria No. 326, pisos 4 y 5
Zona Centro
25000 Saltillo, Coah.
phone: (52 16) 11 01 66 or
(52 16) 11 01 67
fax: (52 16) 11 01 98

Quim. José Luis Tamez Garza
Delegado del Estado de Nuevo Leon
Palacio Federal
Av. Benito Juárez y Corregidora, 2º Piso
67100 Guadalupe, NL
phone: (52 8) 354 97 42 or
(52 8) 354 03 91
fax: (52 8) 355 10 94

Mvz. Abundio González González
Delegado del Estado de Tamaulipas
Hernán Cortés No. 101
esq. República de Argentina
Col. Pedro Sosa
87120 Ciudad Victoria, Tamps.
phone: (52 131) 286 63 or
(52 131) 290 44
fax: (52 131) 295 54

CNA State and Regional Offices

Mexican State or Region	State or Regional Manager	Telephone/Fax
Northwest Region (Baja California, Sonora, Sinaloa)	Dr. Francisco Oyarzabal Tamargo Regional Manager Gpe. Victoria y California, Edificio SARH Colonia Sochiloa Ciudad Obregón, Sonora	phone: (52 641) 6 55 10, (52 641) 6 58 80, or (52 641) 6 87 78
Northern Region (Chihuahua, Coahuila, Tamaulipas)	Ing. Jose Luis Montalvo Espinosa Regional Manager Blvd. Revolución 2343 Oeste Colonia Centro Torreón, Coahuila	phone: (52 17) 17 42 28 or (52 17) 17 51 57
Baja California	Ing. Rubén Roa Quiñones	phone: (52 65) 54 12 27 or (52 65) 54 25 28 fax: (52 65) 54 07 90
Sonora	Ing. Luis A. León Estrada	phone: (52 63) 13 03 47 or (52 63) 13 03 61 fax: (52 63) 13 04 00
Sinaloa	Ing. Carlos M. Estrada Cañedo	phone: (52 67) 60 14 54 or (52 67) 60 14 47 fax: (52 67) 60 14 34
Chihuahua	Ing. Héctoe Hugo García Peña	phone: (52 14) 13 98 40 or (52 14) 14 04 60 fax: (52 14) 14 13 38
Coahuila	Ing. Oscar Gutiérrez Santana	phone: (52 84) 30 03 79 fax: (52 84) 30 03 18
Tamaulipas	Ing. Alfredo Mora Magaña	phone: (52 131) 2 69 03 or (52 131) 2 15 07 fax: (52 131) 2 05 06

Mexican State Environmental Offices

M.C. Adolfo González
Dirección General de Ecología
Gobierno de Baja California
Dr.Atl No. 17.
Zona del Río.
Tijuana, BC
phone: (52 66) 21 82 49
fax: (52 66) 37 27 04

María Elena Barajas Olvera
Dirección General de Normatividad Ecológica
Gobierno del Estado de Sonora
Tehuantepec y Comonfort.
Edificio Administrativo, Piso 2
Hermosillo, Son.
phone: (52 62) 13 19 66
fax: (52 62) 13 19 66

Ing. José Treviño Fernández
Dirección de Ecología
Gobierno del Estado de Chihuahua
Allende No. 1222
Segundo Piso
Colonia Centro.
31000, Chihuahua, Chih.
phone: (52 14) 10 64 40
fax: (52 14) 15 49 37

Dr. Rodolfo Garza Gutierrez
Dirección General de Ecología
Gobierno del Estado de Coahuila
Victoria No. 406, Primer Piso
Zona Centro
25000, Saltillo, Coah.
phone: (52 84) 12 56 22
fax: (52 84) 14 92 13

Ing. Julián de la Garza Castro
Subsecretaría de Ecología
Gobierno del Estado de Nuevo León
5 de Mayo No. 525 Ote.
Edificio Elizondo Páez, Piso 4
Monterrey, NL
phone: (52 8) 3 44 11 79, 3 45 17 23
fax: (52 8) 3 40 42 61, 3 43 71 39

Arq. Arturo Sepúlvada Lerma
Subsecretaría de Desarrollo Urbano y Ecología.
Gobierno del Estado de Tamaulipas
Torre de Gobierno "José López Portillo,"
Pisos 7 y 8
Boulevard Praxedis Balboa S/N
Colonia Centro, 87000, Ciudad Victoria, Tamps.
phone: 52 (131) 2 32 42
fax: 52 (131) 2 32 42

Advisory Councils

U.S. Good Neighbor Environment Board Members

James Marston, Chair
Director, Texas Office
Environmental Defense Fund
44 East Avenue, Suite 304
Austin, TX 78701
phone: (512) 478-5161
fax: (512) 478-8140
e-mail: jimm@edf.org

Pat Benegas
General Manager
Water and Sanitation District
P.O. Box 1751
1470 N. 4th Street
Anthony, NM 88021
phone: (505) 882-3922
fax: (505) 882-3925

Tibaldo Canez
Director, U.S.-México Border Affairs
Arizona Department of Environmental Quality
3033 North Central
Phoenix, AZ 85012
phone: (602) 207-2203
fax: (602) 207-2218

John K. Flynn
Supervisor, Ventura County
808 S. Victoria Avenue
Ventura, CA 95665
phone: (805) 654-2706
fax: (805) 654-2226

Charles G. Groat, Ph.D.
Director, Center for Environmental
Resource Management
University of Texas at El Paso
El Paso, TX 79968
phone: (915) 747-5494
fax: (915) 747-5145
e-mail: cgroat@utep.edu

Alison Hughes
University of Arizona College of Medicine
2501 E. Elm Street
Tucson, AZ 85716
phone: (520) 626-7946
fax: (520) 326-6429
e-mail: ahughes@ccit.arizona.edu

M. Lisa LaRocque
Director, Project Del Rio
1494A S. Solano
Las Cruces, NM 88001
phone: (505) 522-7511
fax: (505) 522-0775
e-mail: llarocque@igc.org

Wendy Laird
Executive Director
Tucson Audubon Society
300 East University Blvd., Suite 120
Tucson, AZ 85705
phone: (520) 629-0757
fax: (520) 622-5622
e-mail: wlaird@azstarnet.com

David Merk
Vice President
Greenfield Environmental
15151 Innovation Drive
San Diego, CA 92128
phone: (619) 670-1621

Colleen Morton
Vice President
Institute of the Americas
10111 N. Torrey Pines Road
La Jolla, CA 92037
phone: (619) 453-5560
fax: (619) 453-2165
e-mail: cmorton@weber.ucsd.edu

Elsa R. Saxod
Director, Border Progress Foundation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
phone: (619) 291-1574
fax: (619) 291-3827
e-mail: borderprog@aol.com

Christine M. Sierra, Ph. D.
Department of Political Science
2074 Social Science Bldg.,
University of New Mexico
Albuquerque, NM 87131-1121
phone: (505) 277-1098
fax: (505) 277-2821
e-mail: csierra@unm.edu

David R. Smith, M.D.
Commissioner, Department of Health
1100 West 49th Street
Austin, TX 78756-7111
phone: (512) 458-7375
fax: (512) 458-7477
e-mail: dsmith@pers.tdh.state.tx.us

Bill Summers
President
Rio Grande Valley Chamber of Commerce
P.O. Box 1499
Weslaco, TX 78599-1499
phone: (210) 968-3141
fax: (210) 968-0210

J. Jorge Verduzco
Executive Vice President
International Bank of Commerce
P.O. Drawer 1359
Laredo, TX 78042-1359
phone: (210) 726-2556
fax: (210) 722-2556
e-mail: jverduzco@iboc.com

Kenneth Williams
Legislative Council Member
Tohono O'Odham Nation
P.O. Box 827
Sells, AZ 85634
phone: (520) 383-2221
fax: (520) 383-2479

FEDERAL AGENCIES

Dennis Burke
Office of NAFTA
U.S. Department of Commerce
14th St. & Constitution Ave., N.W.
Washington, D.C. 20230
phone: (202) 482-5779
fax: (202) 482-5865
e-mail: burke@usita.gov

Bernard Gaillard
Director, Secretarys Office of
International Transportation and Trade
U.S. Department of Transportation
400 Seventh Street S.W.
Washington, DC 20590
phone: (202) 366-4368
fax: (202) 366-7417

Cipriano Garza
Office of Native American Programs
HUD
451 Seventh Street S.W.
Washington, DC 20410
phone: (202) 755-0102
fax: (202) 755-0182

John Klein
Assistant Regional Hydrologist
U.S. Geological Survey
2800 Cottage Way, Room W2233
Sacramento, CA 95825
phone: (916) 979-2610
fax: (916) 979-2669

Felicia Marcus
Regional Administrator
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
phone: (415) 744-1001
fax: (415) 744-2499

Alan Stephens
State Director, Rural Development
U.S. Department of Agriculture
3003 Central Avenue, Suite 900
Phoenix, AZ 85012
phone: (602) 280-8754
fax: (602) 280-8708

M. Elizabeth Swope
Coordinator for U.S.-México Border Affairs
Office of Mexican Affairs
U.S. Department of State
2201 C Street, N.W.
Washington, DC 20520
phone: (202) 647-8529
fax: (202) 647-5752

Rosendo Trevino III
State Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
6200 Jefferson Street, Northeast
Albuquerque, NM 87109-3734
phone: (505) 761-4400

Richard Walling
Director, Office of the Americas and the Middle East
Office of International and Refugee Health
U.S. Department of Health and Human Services
Room 18-75, Parklawn Building
Rockville, MD 20857
phone: (301) 443-4010
fax: (301) 443-6288
e-mail: rwalling@osophs.ssw.dhhs.gov

INTERNATIONAL ORGANIZATION

John Bernal
U.S. Commissioner
International Boundary and Water Commission
4171 N. Mesa, Suite C-310
El Paso, TX 79902
phone: (915) 534-6677
fax: (915) 534-6680

DESIGNATED FEDERAL OFFICER

Robert L. Hardaker
Office of the Administrator
U.S. Environmental Protection Agency
401 M Street S.W.
Washington, DC 20460
phone: (202) 260-2477
fax: (202)-260-6882
e-mail: hardaker.robert@epamail.epa.gov

REGIONAL ADVISORY COUNCIL FOR SUSTAINABLE DEVELOPMENT (REGION 1)

Baja California

M. en C. Adolfo González Calvillo
General Director
Dirección General de Ecología
del Gobierno del Estado de Baja California
Paseo de los Héroes y Dr. Atl N° 17
Zona de Río, CP 22320, Tijuana BC
phone: 91 (66) 84 05 26, 84 04 08 or 34 63 77
fax: 91 (66) 34 27 04
Government Sector Representative

C. José Daniel León Cortez
President
Federación de Unidades de Producción
Pesquera Ejidales de Baja California
Blvd. Zertuche y Azucenas N° 299
Fracc. Valle Dorado, CP 22890, Ensenada, BC
phone: 91 (61)76 78 80
Social Sector Representative

Lic. Norma Patricia Martínez Ríos del Río
Vice President
Grupo Pro Esteros, Lagunas y Marismas
de las Californias SC
Av. Ruiz N° 1687
Zona Centro, CP 22800, Ensenada, BC
phone & fax: 91 (61) 78 60 50
e-mail: proester@cicese.mx
Nongovernmental Organization Representative

Arq. Oscar Romo Ruiz
Director
ECOPARQUE y el Colegio de la Frontera Norte A.C.
Boulevard Abelardo L. Rodríguez # 2925
Zona del Río, CP 22320, Tijuana, BC
phone: 91 (66) 84 22 26 or 24 05 31
fax: 84 22 26, ext. 6029 or 84 87 95
e-mail: OROMO@dns.cincos.net
Academic Sector Representative

M. en C. Carlos Roberto De Alba Pérez
Administrative Coordinator of the Tuna-Dolphin Program
Centro de Investigación Científica y
Educación Superior de Ensenada (CICESE)
Km. 107 carretera Tijuana-Ensenada
CP 22860, Ensenada, BC
phone & fax: 91(617) 4 56 38 and 39
e-mail: alba@bahia.ens.uabc.mx
Private Sector Representative

Baja California Sur

Ing. Alfonso González Ojeda, Secretary
Arq. Felipe Aviles García, Assistant Secretary
Secretaría de Planeación Urbana e
Infraestructura del Gobierno del Estado
Palacio de Gobierno 2° Nivel
Isabel la Católica entre Allende y Bravo
Col. Centro, CP 23000, La Paz, BCS
phone: 91 (112) 2 94 77, 2 94 27 or 2 91 34
fax: 91 (112) 2 90 01
Government Sector Representative

Ing. Armando Covarrubias Flores
Presidente
Productores en Alianza para el Campo y Pesca, S.A. de C.V.
Boulevard Agustín Olachea 51
Col. Centro, CP 23600, Cd. Constitución, BCS
phone: 91(113) 2 53 44
Social Sector Representative

M. en C. Oscar Alfredo Arizpe Covarrubias
Sociedad de Historia Natural Niparajá, A.C.
Zaragoza N° 30
Col. Centro, CP 23000, La Paz, BCS
phone: 618 91 (112) 1 28 01, 1 11 40
fax: (112) 1 24 77
e-mail: oarizpe@calafia.uabcs.mx
Nongovernmental Organization Representative

M. en C. Jesús Druk González
Rector
Universidad Autónoma de Baja California Sur
Km. 5.5 Carretera al Sur
CP 23089, La Paz, BCS
phone: 91 (112) 118 70, 1 07 77, or 117 55 ext. 102 and 103
Academic Sector Representative

Lic. Víctor Manuel Martínez de Escobar Cobela
President, House of Representatives
Alvaro Obregón N°1670
Restaurante Bachos, between 16 de septiembre and callejón la paz
Col. Centro, BCS
phone: 91 (112) 30 200
fax: 91 (112) 34 465
Private Sector Representative

Coahuila

Lic. Rogelio Ramos Oranday
Secretary
Secretaría de Desarrollo Social del Gobierno del Estado
Victoria N° 406, 3er. piso
Zona Centro, CP 25000, Saltillo, Coah.
phone: 91 (84) 12 87 23, 14 96 03 or 12 39 03
fax: 91 (84) 12 43 20
Government Sector Representative

C. Armando Verduzco González
President
Federación Estatal de Propietarios Rurales de Coah.
Boulevard Harold R. Pape, N° 1111
Col. Los Pinos, CP 25720, Monclova, Coah.
phone: 91 (86) 34 13 40
fax: 91 (86) 35 28 88
Social Sector Representative

Lic. Cruz Porto Ramírez
Consultant
Perfiles A.C.
Calle Dr. Jesús Valdez Sánchez N° 1365
Col. Universidad, CP 25260, Saltillo, Coah.
phone: 91 (84) 15 84 07
fax: 91 (84) 15 42 11
Nongovernmental Organization Representative

Dr. Miguel Angel Capo Arteaga
General Academic Director
Universidad Autónoma Agraria "Antonio Narro"
Buenavista, C. P. 25315, Saltillo, Coah.
phone: 91 (84) 17 31 84
fax: 91 (84) 17 36 64
Academic Sector Representative

Ing. Raúl Mora Rodríguez
Environmental Protection Consultant
Cámara Nacional de la Industria de Transformación
Delegación Saltillo y Zona Conurbada
Av. Universidad N° 514
CP 25000, Saltillo, Coah.
phone: 91 (84) 16 36 37
fax: 91 (84) 15 58 41
Private Sector Representative

Chihuahua

Ing. Horacio González de las Casas
General Director
Dirección General de Desarrollo Rural del Gobierno del Estado
Venustiano Carranza N° 815, 6° Piso
Edif. Héroes de la Revolución
Zona Centro, CP 31000, Chihuahua, Chih.
phone: 91 (14) 15 80 98
fax: 91 (14) 29 33 00 ext. 260, 2600 and 2604
Government Sector Representative

Ing. Ricardo Villalobos Figueroa
President
Asociación Civil de Usuarios del
Distrito de Riego 083, Papigochi
Km. 6+606, carretera principal de derecha
Col. 10 de mayo, Guerrero, Chih.
phone: 91 (158) 6 03 91
fax: 91 (158) 6 02 46
Social Sector Representative

Dr. Arturo Limón Domínguez, President
Sr. Eduardo Carrillo Rubio, Representative
Movimiento Ecologista Mexicano
del Estado de Chihuahua
Cortés de Monroy Nº 3102
Col. Parque de San Felipe, CP 31240, Chihuahua, Chih.
phone: 91 (14) 20 62 82, 20 62 62 ext. 130
Nongovernmental Organization Representative

Ing. María del Rosario Díaz Arellano
Coordinator
Centro de Estudios del Medio Ambiente
Universidad Autónoma de Ciudad Juárez
Av. del Charro Nº 610 Norte
CP 32320, Ciudad Juárez, Chih.
phone/fax: 91 (16) 17 57 58
Academic Sector Representative

Lic. José Alberto León Sánchez
Manager
Unión de Productores Industriales
Forestales de Chihuahua, A.C.
Calle Libertad Nº 3, piso 13
Torre Bancomer, Sector Centro
CP 31000, Chihuahua, Chih.
phone: 91 (14) 16 22 02, 16 20 11
fax: 16 20 88
Private Sector RepresentativeDurango

Durango

Quim. Luis Alfredo Rangel Pescador
Director
Dirección de Ecología del Gobierno del Estado
Calle del parque y loza S/N
Col. Los Angeles, CP 34000, Durango, Dgo.
phone: 91 (18) 12 12 23, 12 06 70, 12 43 10,
13 34 21, 11 11 94
fax: 12 84 14
Government Sector Representative

Ing. Jorge I. Ramos Astorga
Director Técnico
Social Unidad de Conservación y Desarrollo
Forestal Nº 3
Francisco I. Madero Nº 401 A Sur, int. 101
Col. Centro, CP 34000, Durango, Dgo.
phone/fax: 91 (18) 13 08 41
Social Sector Representative

Ing. Raúl García Meraz
Administrador Único
Ingeniería Ambiental Consultores, S.A. de C.V
Calle 14 Nº 384
Col. Filadelfia, CP 35010, Cd. Gómez Palacio, Dgo.
phone/fax: 91 (17) 15 05 31
Nongovernmental Organization Representative

Dra. Mª Teresa Alarcón Herrera
Professor and Investigator
Instituto Tecnológico de Durango
Boulevard Felipe Pescador Nº 1830 Oriente
CP 34080, Durango, Dgo.
phone: 91(18)18 47 52, 18 48 12, 18 55 86,
18 48 71, 18 56 46
fax: 91(18) 18 48 13
Academic Sector Representative

Ing. Gerardo Roberto Peyro Andrade
Director
Asociación de Industriales Forestales
de Durango, A.C.
Independencia 135 Sur
Zona Centro, CP 34000, Durango, Dgo
phone: 91 (18) 12 97 12
fax: 91 (18) 12 44 35
Private Sector Representative

Nuevo Leon

Ing. Julián de la Garza Castro
Representative and Subsecretary
Subsecretaria de Ecología del Estado de Nuevo León
5 de mayo 525 Ote.
4º piso Edif. Daniel Elizondo Paez
Centro, Monterrey, NL, CP 64000, Monterrey NL
phone: 91 (8) 344 11 79, 343 71 39
fax: 91 (8) 340 42 61
Government Sector Representative

Ing. Fernando Páez Moreno
Assistant and Coordinator
Comision Estatal de Ecologia
Gerente de Control Ambiental Corporativo Grupo CYDSA
Av. Ricardo Margain Zuzaya 325
Col. Valle del Campestre, CP 66220, Garza García, NL
phone: 335 17 56, 335 58 41
fax: 335 90 90/935
Government Sector Representative

C.P. Gilberto Reyna Vargas, Assessor
Sra. Rosalba Martinez Hernandez, Assistant
Central Campesina Independiente
Matamoros 832 Oriente
Col. Centro, CP 64000, Monterrey, NL
phone: 91 (8) 342 80 54, 343 01 82 or 343 01 87
fax: 91 (8) 342 79 31
Social Sector Representative

Dr. Alejandro Ramírez Alcazar
Committee Chair
Comité Técnico y de Investigación de la Sociedad Mexicana de Aguas, A.C.
Taxco Nº 265
Col. Regina, CP 64290, Monterrey, NL
phone: 91 (8) 3 51 68 22
fax: 91 (8) 3 52 63 54
Nongovernmental Organization Representative

Dr. Reyes S. Tamez Guerra
Rector of the University
Universidad Autónoma de Nuevo León
Av. Fidel Velázquez y Alfonso Reyes S/N
Cd. Universitaria, CP 66450, San Nicolas de los Garzas, NL
phone: 91 (8) 3 52 55 81
fax: 91 (8) 3 76 77 57
Academic Sector Representative

Ing. Benjamín Limón Rodríguez
Assistant and General Director
Facultad de Ingeniería Civil
Apartado 17,
Ciudad Universitaria San Nicolás de los Garza, NL CP 66450
phone: 3 52 13 67
fax: 3 52 49 69, ext. 261
phone/fax: 3 76 69 40
e-mail: blimon@intercable.net
Academic Sector Representative

Dr. Juan Antonio Cuéllar López
General Director
Instituto para la Protección Ambiental
Cámara de la Industria de la Transformación de Nuevo León
Av. Parque Fundidora Nº 501
CITERMEX 1er. nivel, local 95-C
Col. Obrera, CP 64010, Monterrey, NL
phone: 91 (8) 3690250-55 ext. 1402
fax: 91 (8) 3690252, 3696414
Private Sector Representative

Sinaloa

Lic. Adalberto Castro Castro
Secretary
Secretaría de Desarrollo Social
Medio Ambiente y Pesca del Gobierno del Estado
Palacio de Gobierno 3er. piso, Lázaro Cárdenas e Insurgentes S/N
Col. Centro, CP 80129, Culiacán, Sin.
phone: 91 (67) 14 43 03, 14 15 24
fax: 14 42 54
Government Sector Representative

Lic. Jesús Rafael Ruvalcaba León
Federal Delegate
Cámara de Diputados
Av. Federico Gamboa Nº 2302
Col. Aeropuerto, CP 80135, Culiacán, Sin. AP. 523
phone: 91 (67) 60 04 62
Social Sector Representative

M. en C. Luis Miguel Flores Campaña
Director
Consejo Ecológico de Mazatlán
Universidad Autónoma de Sinaloa
Escuela de Ciencias del Mar
Paseo Clausen S/N

Zona Centro CP 82000, Mazatlán, Sin. AP. 610
phone: 91(69) 82 86 56
fax: 85 02 82
Nongovernmental Organization Representative

Dr. Fausto Burgueño Lomelí
General Director
Centro de Ciencias de Sinaloa
Ave. de las Américas Nº 2771 Norte
CP 80010, Culiacán, Sin.
phone: 91 (67) 12 29 49
fax: 91 (67) 16 93 83
e-mail: fausto@computo.ccs. conacyt.mx
Academic Sector Representative

Mtro. Javier Delgadillo Macias,
Representative, Secretario General del Centro de Ciencias de Cinaloa
Ave. de las Américas Nº 2771 Norte
CP 80010, Culiacán, Sin.
phone: 91 (67) 12 31 50, 12 28 80/116, 12 22 92/116, 12 29 28/116
Academic Sector Representative

C. Emilio Alvaro Gastélum Ángulo
President, Federación de Acuacultores de México, A.C.
Juan Escutia Nº 440
Colonia Chapultepec, CP 80040, Culiacán, Sin.
phone/fax: 91 (67) 12 74 45
Private Sector Representative

Sonora

Ing. Vernon Pérez Rubio, Secretary
Secretaría de Infraestructura Urbana y Ecología del Gobierno del Estado
Palacio Administrativo 1er piso
Tehuantepec esq. Comonfort
Col. Centro, CP 83270, Hermosillo, Son.
phone: 91 (62) 13 79 33
fax: 17 17 64, 17 00 92, 17 02 17
Government Sector Representative

C. Julio César Rodríguez Pérez
Diputado de la LIV Legislatura
Liga de Comunidades Agrarias de Sonora, CNC
Pedro Moreno y Tehuantepec Congreso del Estado
CP 83270, Hermosillo, Son.
phone: 91 (62) 13 50 35
fax: 12 33 95
Social Sector Representative

Arq. Octavio Duarte Rosas
General Director and Vice-president
Promotora Duarte
Colegio Sonorense de Arquitectos A.C.
Benito Quintana Nº 1 entre Blvd. Morelos y Juárez
Col. Constitución, CP 83150, Hermosillo, Son.
phone: 91 (62) 14 61 05, 15 94 20
fax: 15 83 95, 10 48 69
Nongovernmental Organization Representative

Dr. Alejandro Emilio Castellanos Villegas
Department Chair, Universidad de Sonora
Centro de Investigaciones Científicas y Tecnológicas (CICTUS)
Rosales y Niños Héroes S/Nº
Col. Centro, CP 83000, Hermosillo, Son. AP. 54
phone: 91 (62) 13 45 64, 12 19 95,
fax: 12 32 71
Academic Sector Representative

Ing. Francisco Javier Villedent Ibarra
President
Cámara Nacional de la Industria Pesquera--Delegación Sonora
Calle 22, Ave. Serdán Edificio Luebbert Planta Alta, Despacho 2
Col. Centro, CP 85400, Guaymas, Son.
phone: 91 (62) 218 09
fax: 205 22 fax, 410 51
Private Sector Representative

Tamaulipas

Arq. Arturo Carlos Sepulveda Lerma
Sub-secretary
Subsecretaría de Desarrollo Urbano y Ecología de la Secretaría de Desarrollo Social del Gobierno del Estado
Torre Gubernamental, 8° piso
CP 87000, Ciudad Victoria, Tamps.
phone: 91 (131) 255 54
fax: 91 (131) 232 42, 297 77 ext. 213
Government Sector Representative

Ing. Carlos Collins Rojas
Subdirector of Transportation
Promoción y Comercialización
Gremio Unido de Alijadores, S.C. de R. L.
Isauro Alfaro N° 210 Sur
Zona Centro, CP 89000, Tampico, Tamps.
phone: 91 (12) 12 43 87, 12 55 55, 12 93 58
fax: 12 43 87, 12 58 35
Social Sector Representative

Ing. Mario Alberto Vázquez Vázquez
Coordinador of the Dept. of Wildlife
Universidad Autónoma de Tamaulipas
Facultad de Agronomía
Centro Universitario Adolfo López Mateos
CP 87149, Ciudad Victoria, Tamps.
phone: 91 (131) 217 38, 2 70 00 ext. 2102 and 2104
Nongovernmental Organization Representative

Dr. Carlos Gutiérrez Nuñez
Director
Universidad Autónoma de Tamaulipas
Instituto de Ecología y Alimentos
Boulevard Adolfo López Mateos N° 928
Col. San José, CP 87040, Ciudad Victoria, Tamps.
phone: 91 (131) 627 21
fax: 6 42 89
Academic Sector Representative

C.P. Salvador Salazar Herrera
General Manager
Asociación de Industriales del Sur de Tamaulips, AC
Av. Hidalgo N° 3610
Col. Flores, CP 89220, Tampico, Tamps.
phone: 91 (12) 17 09 80
fax: 91 (12) 13 81 50

Information Repositories in the United States

REGION 6
BORDER XXI
INFORMATION REPOSITORY LISTINGS
TEXAS AND NEW MEXICO BORDER REGION

CITY/AREA	LIBRARY	PHONE NO.
EPA El Paso Border Office, TX	U.S. EPA Region 6 4050 Rio Bravo, Suite 100 El Paso, TX 79902	(915) 533-7273
EPA Region 6 Dallas, TX	EPA Library 1445 Ross Avenue Dallas, TX 75202	(214) 665-6444
Washington, DC	U.S. EPA Public Information Center 401 M Street, SW Washington , D.C. 20460	(202) 260-2080
Edinburg, TX	University of Texas- Pan American Library Government Documents Division 1201 West University Drive Edinburg, TX 78539-2999	(210) 381-3304
El Paso, TX	El Paso Public Library Documents Genealogy Section 501 North Oregon Street El Paso, TX 79901	(915) 543-5433
El Paso, TX	University of Texas at El Paso Library Documents and Maps Department El Paso, TX 79968-0582	(915) 747-5685
Laredo, TX	Laredo Community College Harold R. Yeary Library Government Documents Section West End Washington Street Laredo, TX 78040-4395	(210) 721-5270
Las Cruces, NM	New Mexico State University Branson Library Documents Dept 3475 P.O. Box 30006 Corner of Frenger & Williams Street Las Cruces, NM 88003-0006	(505) 646-3737
Harlingen, TX	TNRCC- Region 15 Matz Building 513 E. Jackson Harlingen, TX 78559	(210) 425-6010

REGION 6
BORDER XXI
INFORMATION REPOSITORY LISTINGS
TEXAS AND NEW MEXICO BORDER REGION

CITY/AREA	LIBRARY	PHONE NO.
San Antonio, TX	TNRCC - Region 13 140 Heimer Rd. Suite 360 San Antonio, TX 78232-5042	(210) 490-3096
El Paso, TX	TNRCC- Region 6 7500 Viscount, Suite 147 El Paso, Texas 79925	(915) 778-9634

REGION 9
BORDER XXI
INFORMATION REPOSITORY LISTINGS
CALIFORNIA AND ARIZONA BORDER REGION

CITY/AREA	LIBRARY	PHONE NO.	CONTACT PERSON
San Diego, CA	Central Library 820 E Street San Diego, CA 92101	(619) 236-5800	Frances Bookheim
Chula Vista, CA	Chula Vista Library 365 F Street Chula Vista, CA 91910	(619) 691-5069	Eric Rhee
Imperial Beach, CA	San Diego County - Imperial Beach Branch 810 Imperial Beach Boulevard Imperial Beach, CA 91932	(619) 424-6981	L. Robinson
San Ysidro, CA	San Ysidro Branch Library 101 W. San Ysidro Boulevard San Ysidro, CA 92173	(619) 424-0475	Jim Frazier
Otay-Mesa, CA	Otay-Mesa Branch 3003 Coronado Avenue San Diego, CA 92154	(619) 424-0474	Christine Gonzalez
Potrero, CA	Potrero Public Library 24955 Library Lane Potrero, CA 91963	(619) 478-5978	Candy Bonner
Jacumba, CA	Jacumba County Library 44511 Old Highway 80 Jacumba, CA 91934 Mail to: P.O. Box 186	(619) 766-4608	Sherry Davis
Alpine, CA	Alpine County Library 2130 Arnold Way Alpine, CA 91901	(619) 445-4221	Pat Szelenyi
Campo, CA	Campo Marina County Library P.O. Box 207 Campo, CA 91906	(619) 478-5945	Sherry Davis
Imperial, CA	Imperial Public Library 200 West 9th Street Imperial, CA 92251 Mail to: P.O. Box 3A	(619) 355-1332	Gregorio M. Ponce
Calexico, CA	Camarena Memorial Library 850 Encinas Avenue Calexico, CA 92231	(619) 768-2170	Sandra Tauler

REGION 9
BORDER XXI
INFORMATION REPOSITORY LISTINGS
CALIFORNIA AND ARIZONA BORDER REGION

CITY/AREA	LIBRARY	PHONE NO.	CONTACT PERSON
Yuma, AZ	Yuma County Library 350 S. 3rd Avenue Yuma, AZ 85364	(520) 782-1871	Maggie Menard
Nogales, AZ	Nogales-Santa Cruz County Public Library 518 N. Grande Avenue Nogales, AZ 86521	(520) 287-2285	Suzanne Haddock
Bisbee, AZ	Copper Queen Library 6 Main Street Bisbee, AZ 85603 Mail to: P.O. Box 1857	(520) 432-4232	Lise Gilliland
Douglas, AZ	Douglas Public Library 625 10th Street Douglas, AZ 85607	(520) 364-3851	Jule De Voe

APPENDIX 3

A Brief Description of Government Agencies Involved in the Border XXI Program

Mexico and the United States have a history of environmental cooperation extending over the past 100 years. In addition to the environmental agencies and laws of each government on the federal level, state and local environmental laws and institutions also exist and are very important. The following is a brief description of governmental agencies at the federal level involved with the environment and natural resources of the border area.

Agencies within the Federal Government of the United States

U.S. Environmental Protection Agency - EPA

EPA is charged by Congress to protect the nation's land, air, and water systems. Under a mandate of federal environmental laws, the Agency strives to formulate and implement actions that lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

EPA works in partnership with state, county, municipal, and tribal governments to carry out its mission. State and local standards may exceed federal standards, but they cannot be less stringent. EPA works with states and municipalities so they can carry out federal standards consistently but flexibly. The Agency also makes extensive efforts to involve the public in environmental protection. Some laws specifically invite public monitoring; others allow individuals to sue polluters or to notify environmental agencies of violations.

Through research, development, and technical assistance, EPA generates and disseminates sound science and engineering to support its missions. These efforts provide the data that the Agency needs to set and address priorities in identifying, assessing, and managing serious risks to public health and the environment. EPA's research combines the in-house expertise of Agency scientists and engineers with complementary research by universities and nonprofit organizations under a competitive, peer-review extramural program.

EPA was formally established as an independent agency in the Executive Branch in December 1970. The Agency incorporated various departments and independent agencies responsible for air and water pollution control, solid-waste management, pesticide regulation, a program for monitoring radiation, and the drinking water program.

Today, EPA administers eleven comprehensive environmental protection laws: the Clean Air Act; the Clean Water Act; the Safe Drinking Water Act; the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund"); the Resource Conservation and Recovery Act; the Federal Insecticide, Fungicide, and Rodenticide Act; the Toxic Substances Control Act; the Uranium

Mill Tailings Radiation Control Act; the Lead Contamination Control Act; the Ocean Dumping Ban Act; and the National Environmental Education Act.

The Agency is directed by an Administrator and a Deputy Administrator, both appointed by the President with the advice and consent of the Senate. Nine Assistant Administrators, the Agency's General Counsel, and its Inspector General also are named by the President and are subject to Senate confirmation.

The nine Assistant Administrators manage specific programs, such as those protecting the air, water, and land of Americans, or direct other Agency functions, such as enforcement of environmental laws and international activities.

Three Associate Administrators are named by the Administrator to carry out programs for public affairs, congressional and legislative relations, and regional, state, and local relations.

Ten Regional Administrators work closely with state and local governments to carry out the Agency's mission.

U.S. Department of Interior - DOI

As the nation's principal conservation agency, DOI has responsibility for most of our nationally-owned public lands and natural and cultural resources. This responsibility includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Department of the Interior has a headquarters and regional structures and each bureau has headquarters, regional, and field structures. On August 11, 1994, an Environmental Charter was executed in Washington, D.C. and signed by all seven of the DOI bureaus that have activities in the border region. This charter formally established a DOI U.S.-Mexico Border Field Coordinating Committee and recognizes that "the border region contains nationally significant natural and cultural resource protection areas such as national parks, national wildlife refuges, national forests, national conservation areas, wilderness areas, waterways, natural resources, and special areas for protection on the outer continental shelf." The charter also recognizes that "a myriad of federal trust species, including federally endangered or threatened species, migratory birds, and some marine mammals, occur in the border area." The seven DOI bureaus agreed to form this cross-bureau committee with a mandate to promote, facilitate, and enhance communication and coordination between and among the signatories of the Environmental Charter on U.S.-Mexico border-related issues. The committee acts as DOI's principal mechanism to increase coordination with our counterparts in Mexico and other agencies to focus attention on environmental issues along the border.

DOI Bureau of Indian Affairs - BIA

BIA's mission is to enhance the quality of life, promote economic opportunity, and carry out the responsibility to protect and improve the trust assets of American Indians, Indian tribes, and Alaska Natives. BIA manages a complex, multifaceted organization that includes programs in education, social services, law enforcement, courts, housing improvement, financial services, irrigation, road construction, natural resource management, and land tenure. BIA's priority is to support and enhance tribal governments by fostering cooperation and coordination in consultation with Indian tribes, while supporting self-determination and tribal sovereignty.

DOI Bureau of Land Management - BLM

BLM is responsible for sustaining the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations. BLM administers 2.8 million hectares (6.9 million acres) of public land located in California, Arizona, and New Mexico, within 100 kilometers (62 miles) of the U.S.-Mexico border region. BLM administers these public lands within a framework of numerous laws. The most comprehensive of these is the Federal Land Policy and Management Act of 1976 (FLPMA). FLPMA requires that public lands are managed under the principles of multiple use and sustained yield. All BLM policies, procedures, and management actions must be consistent with FLPMA and other laws that govern the use of public land.

DOI Bureau of Reclamation - BOR

BOR's mission involves management, protection, and enhancement of water and related resources in an environmentally and economically sound manner for urban, agricultural, and wildlife uses, as well as flood control and recreation. While the economic basis for many BOR projects was irrigated agriculture, because of rapid population growth, including areas along the border, there is a shifting emphasis in water demand for municipal, industrial, and environmental uses. In response to changing national priorities and values, BOR is now engaged in integrating innovative technologies that focus on a balanced approach to water resources management in order to meet these changing needs.

DOI Fish and Wildlife Service - FWS

FWS has a broad mandate to conserve, protect, and enhance fish and wildlife resources and their habitats for the continuing benefit of people. The FWS's major responsibilities are for migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish. FWS accomplishes this by managing a system of national wildlife refuges, provides compliance with federal laws and regulations, and offers technical assistance and funds to other federal agencies, states, tribes, local governments, and private land owners. FWS has international mandates under such laws and treaties as the Migratory Bird Treaty Act of 1918, the North American Wetlands Conservation Act, and international agreements under the Endangered Species Act and the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

DOI Minerals Management Service - MMS

MMS is responsible for the management of the federal outer continental shelf - submerged lands off U.S. coasts, in which the U.S. has sovereignty over the natural resources, in a seabed that parallels the U.S. shoreline. These lands, seaward of state waters, have the potential to supply a significant portion of the U.S. energy and mineral needs. Outer Continental Shelf (OCS) leases currently account for about one-fourth of U.S. domestic natural gas production and one-eighth of our U.S. domestic oil production.

DOI National Park Service - NPS

The principal responsibility of NPS is the protection of park resources in support of the 1916 legislation that created NPS and charged the agency "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The system now comprises more than 349 areas of great diversity including parks, monuments, historic sites, battlefields, seashores and lakeshores, and recreation areas. NPS also directs programs to assist states, other federal agencies, local governments, and individuals in the protection of historical, natural, and archeological resources.

DOI U.S. Geological Survey - USGS

USGS is the largest earth-science research and information agency in the U.S. It was established to conduct systematic and scientific "classification of the public lands and examination of the geologic structure, mineral resources, and products of the national domain." USGS provides geologic, topographic, and hydrologic information that contributes to the wise management of natural resources and promotes the health, safety, and well-being of the people. This information consists of maps, databases, and descriptions and analyses of water, energy, and mineral resources, land surface, underlying geologic structure, and dynamic processes of the earth.

DOI USGS Biological Resources Division - BRD

BRD is devoted to providing quality biological science. The mission of BRD is to work cooperatively with other entities to provide scientific understanding and technologies needed to support sound management and conservation of our national biological resources. The primary role of BRD is to meet biological research needs of other organizations within DOI, other federal agencies, states, local entities, tribes, and private and nonprofit users.

U.S. Department of State- DOS

DOS advises U.S. agencies on foreign policy and international issues, events, and matters relating to international law and U.S. commitments and responsibilities under international agreements. DOS facilitates formal communication with the government of Mexico through the U.S. Embassy in Mexico City on substantive environmental policy matters and on proposed travel of U.S. officials between the U.S. and Mexico. The State Department also provides representation on interagency

environmental task groups and negotiating sessions on bilateral agreements developed to improve U.S.-Mexican environmental cooperation.

Council on Environmental Quality - CEQ

The Council was established within the Executive Office of the President by the National Environmental Policy Act of 1969 to formulate and recommend national policies to promote the improvement of the quality of the environment. The Council consists of three members appointed by the President with the advice and consent of the Senate, and one of the members is designated as chairman by the President.

The Council develops and recommends to the President national policies that further environmental quality; performs a continuing analysis of changes or trends in the national environment; reviews and appraises programs of the federal government to determine their contributions to sound environmental policy; conducts studies, research, and analyses relating to ecological systems and environmental quality; assists the President in the preparation of the annual environmental quality report to the Congress; and oversees implementation of the National Environmental Policy Act.

U.S. Department of Agriculture - USDA

USDA Forest Service

The Forest Service is the largest and most diverse agency within the U.S. Department of Agriculture. It provides leadership in the management, protection, and use of the Nation's forests and grasslands, almost two-thirds of the Nation's federally owned lands. The Forest Service also conducts forestry research and partners with forest managers on State and Private lands to encourage forest health nationwide. Currently, there are 155 National Forests, 19 National Grassland, and 16 Land Utilization Projects located in 44 states, Puerto Rico and the Virgin Islands. Two National Forests, the Coronado National Forest and the Cleveland National Forest, border Mexico for a total acreage of 2,268,751 acres.

The Forest Service is dedicated to multiple-use management for the sustained yields of renewable resources such as water, forage, wildlife, wood and recreation. Multiple-use means managing resources in a way that ensure environmental quality while at the same time meeting the needs of the communities surrounding the forest as well as the nation at large, both for present and future generations.

Under the Forest Service International Forestry Division, cooperation with Mexico has been very active. Since the first signing of a Memorandum of Understanding on the Advancement of Scientific and Technological Cooperation between the U.S. and Mexico in 1972, the program has grown to include 14 bilateral working groups and 8 trilateral study groups (U.S., Mexico and Canada). These groups jointly implement research and management projects in subject areas of mutual interest such as: fire management (including fire suppression, fire prevention, and fire ecology), forest genetics, atmospheric change, natural forest and plantation management, forest insects and disease, forest products and land management planning, to name a few.

USDA Natural Resources Conservation Service - NRCS

The mission of NRCS is to provide leadership and administer programs to help people conserve, improve, and sustain our natural resources and environment. In order to achieve our mission, NRCS provides technical and financial assistance to private landowners as well as federal, state, and local government. Assistance is provided to plan and implement soil and water conservation and improvement practices on private lands used for crop and timber production, livestock grazing and other domestic uses. Assistance is provided through partnerships with soil and water conservation districts on private, state, and federal lands. Soil and water conservation districts are composed of private citizen volunteers interested in the conservation of natural resources.

U.S. Department of Health and Human Services - HHS

The Department of Health and Human Services is the United States government's principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves.

The Department includes some 250 programs, covering a wide spectrum of activities. HHS works closely with state and local governments, and many HHS-funded services are provided at the local level by state or county agencies or through private sector grantees. The Department's programs are administered by 11 principal HHS operating divisions:

- National Institutes of Health
- Substance Abuse and Mental Health Administration
- Agency for Health Care Policy and Research
- Food and Drug Administration
- Centers for Disease Control and Prevention
- Agency for Toxic Substances and Disease Registry
- Indian Health Service
- Health Resources and Services Administration
- Health Care Financing Administration
- Administration for Children and Families
- Administration on Aging

U.S. Department of Commerce - DOC

The activities of the Department, which include promoting economic growth through civilian technology, export growth, sustainable development, economic development, and economic information and analysis, have worked in strategic harmony to provide increased economic security for all Americans.

The Department of Commerce is the only federal agency tying together economics, environment, trade, technology and information, making the whole greater than the sum of its parts.

Protecting the natural environment and creating high-quality jobs are central goals of Commerce. The Department works with the private sector to create opportunities and incentives so businesses, communities and individuals can prosper through environmentally sound growth. The late Secretary

Brown served on the President's Council on Sustainable Development which is tasked with developing practical approaches to implement sustainable development principles.

Commerce's National Oceanic and Atmospheric Administration (NOAA) has established several strategic sustainable development goals to be accomplished in the next century. These include building sustainable fisheries, recovering protected species, and promoting healthy coastal ecosystems.

Commerce led an interagency group that issued a Strategic Framework for Environmental Technology Exports. Commerce's International Trade Administration (ITA) and its newly formed Office of Environmental Technologies Exports established the Environmental Technology Trade Advisory Committee. The committee will provide direct industry input into developing and managing programs to expand U.S. sales of environmental technologies.

In partnership with the private sector, the Department of Commerce supports one of our country's fundamental goal: enhancing the competitiveness of the national economy and the economic security of the American people. The Department will continue to work towards partnering with the private sector to expand exports, develop and deploy civilian technology, provide economic and environmental information, assist economically troubled communities, and create sustainable development at home and abroad.

National Oceanographic and Atmospheric Administration - NOAA

The National Oceanic and Atmospheric Administration's mission is to describe and predict changes in the Earth's environment and conserve and manage wisely the nation's coastal and marine resources to ensure sustainable economic opportunities. NOAA predicts environmental changes, protects life and property, provides decision-makers with reliable scientific information, and fosters global environmental stewardship. NOAA's two primary missions, environmental assessments and prediction and environmental stewardship, are implemented in an integrated manner through its line organizations and programs including the National Weather Service, National Marine Fisheries Service, National Ocean Service, Office of Oceanic and Atmospheric Research, and National Environmental Satellite, Data, and Information Service.

U.S. Department of Justice - DOJ

The Environment and Natural Resources Division of the Department of Justice (the "Division") is the United States' environmental lawyer. The Division is responsible for representing federal agencies in environmental and natural resources litigation before federal and state courts. Together with colleagues in the 94 U.S. Attorneys' Offices, the Division works closely with our client agencies, such as the Environmental Protection Agency and the Department of Interior, to enforce and defend the nation's environmental and natural resources laws.

A significant portion of the Division's work involves litigation under statutes governing pollution control and environmental protection. This work includes initiating civil enforcement actions to assess liability, prevent pollution, and ensure cleanup; prosecuting those who violate criminal laws intended to prevent pollution; and defending actions that have been brought against federal agencies.

The Division, in conjunction with the U.S. Attorneys' Offices, also represents the United States in all matters concerning the protection, use, and development of the nation's natural resources and public lands, wildlife protection, Indian rights and claims, and the acquisition of federal properties. Finally, the Division also works on policy, legislative, and international matters relating to environmental and natural resource protection.

Agencies within the Federal Government of Mexico

Secretrariat of Environment, Natural Resources, and Fisheries - SEMARNAP

Some of the principle missions of SEMARNAP are the promotion of the transition towards sustainable development, reduction of the processes of environmental deterioration, development of rational use of natural resource potential, and improvement of environmental aspects of productive processes that drive development.

SEMARNAP was established by presidential order and published in the Official Register of the Federation on December 28, 1994. Some of the other priority actions of this institution are encouraging consumption patterns which are more favorable for sustainable development and developing natural resource programs which help reduce poverty.

To this end, SEMARNAP promotes public involvement and transparent environmental and natural resource policies, and pursues a process of decentralization of functions to achieve more efficient integrated regional coordination. In this sense, the Secretariat organized and integrated four regional consultative councils, as well as a national consultative council, which convened state governments, social and business organizations, nongovernmental organizations, and academic and scientific research institutions to promote a partnership in the development and oversight of environmental policy and the beneficial use of natural resources.

Within this context, SEMARNAP both strengthens the legal framework and enforcement of laws, standards and programs, and promotes the modernization of institutional operations to achieve a functional and versatile management approach and transparent performance at all levels of the Secretariat.

SEMARNAP is composed of three undersecretariats: Planning, Natural Resources, and Fisheries, and five decentralized management agencies: the National Water Commission (CNA), the National Institute of Ecology (INE), the Federal Attorney General's Office of Environmental Protection (PROFEPA), the National Fisheries Institute (INP), and the Mexican Institute of Water Technology (IMTA).

The National Commission for the Understanding and Use of Biodiversity (CONABIO) is a centralized division of SEMARNAP.

Subsecretariat of Natural Resources

This agency is responsible for formulating and managing policy for SEMARNAP in the areas of protection and sustainable use of forestry resources, restoration and conservation of soils, management of beaches, the federal maritime zone, and national waters.

Its objective is to establish a structure that combines, organizes, and standardizes these issues in legal and administrative terms, so as to direct them in an integrated way which furthers sustainable development.

To fulfill its mission, the Subsecretariat of Natural Resources is organized into three general divisions: Forestry, Federal Maritime Terrestrial Zones, and Restoration and Conservation of Soils.

Subsecretariat of Fisheries

Based on the concept of sustainable development, the Administration has planned for the growth of the Mexican fishing industry. This entails the consistent application of policies oriented toward the rational use of resources, respect for biodiversity and ecosystems, and the active participation of fishermen under the concept of responsible fishing.

Within this framework, the federal government, through SEMARNAP, has proposed to reorganize its traditional fisheries and develop new options within the industry. Some of these options include revising fishing laws based on strategies developed by the nation's cooperatives and commercial fishermen, conducting a study of fishing activity and of the most important fisheries, developing policies which foster effective management of living marine resources, developing and promoting aquaculture, infrastructure and renovation of the fishing fleet, the strengthening of investigative and species protection programs, financing and investment, and strengthening of international policy.

The Fisheries Subsecretariat has four general divisions to fulfill its mission: Promotion of Fishing, Fisheries Administration, Infrastructure and Fishing Fleet, and Aquaculture.

Federal Attorney General for Environmental Protection - PROFEPA

PROFEPA was created in mid-1992 under the direction of the Secretariat of Social Development, and is currently an autonomous agency of SEMARNAP. PROFEPA's primary objective is to verify compliance with environmental regulations so as to further sustainable development.

Initially, PROFEPA was conceived as the institution in charge of verifying industrial activities within federal jurisdiction through a combination of oversight actions and voluntary compliance under the General Law of Ecological Equilibrium.

Since the creation of SEMARNAP, the federal government has a new organizational plan that integrates environmental and natural resources policies. Under this structure, PROFEPA increased its functions and roles in very significant ways and is now charged with oversight in matters of forestry, fisheries, flora and fauna, as well as federal maritime terrestrial zones and national waters.

In order to fulfill this mission, PROFEPA has three subdivisions: Industrial Compliance Monitoring, Environmental Auditing, and Natural Resources.

National Water Commission - CNA

The CNA is an autonomous agency of SEMARNAP, whose primary objective is to manage the national waters to satisfy the needs of different sectors of society in terms of quantity, quality, time, and space.

As the heir to an important hydraulic tradition, CNA is a service institution that promotes the sustainable development of a strategic and vital resource for the country, namely water.

In order to fulfill its responsibilities, CNA has six general subdivisions: Construction, Operation, Technical, Planning, and Administration, and Water Management.

National Ecology Institute - INE

INE is an autonomous agency of SEMARNAP which has under its authority the design of general environmental regulations and standards and the application of these regulations and standards through various mechanisms.

Its responsibilities cover the following concerns: development of regulations and standards; development of economic incentives; process for licensing and permits; evaluation of the environmental impacts of activities and projects; ecological classification; risk assessment and accident prevention; approval of programs and projects for the management of hazardous and solid wastes; control of transboundary movement of hazardous materials and hazardous wastes; municipal solid waste policy; promotion of environmental infrastructure; creation and management of natural protected areas (including national parks); conservation and management of wild flora and fauna; sustainable management of wild flora and fauna; fulfillment of international agreements in Mexico; technologies for production processes, services, and transport which promote the sustainable use of resources and environmental quality; promotion of scientific research and technology; and environmental information systems.

In order to fulfill its responsibilities, INE is organized into one division for Coordination of Natural Protected Areas, and sections for Wildlife, Environmental Regulation, Environmental Impact and Ecological Management, Hazardous Materials, Waste, and Activities, and Environmental Management and Information.

National Commission for the Understanding and Use of Biodiversity - CONABIO

CONABIO was created by presidential decree on March 16, 1992, with the purpose of coordinating and promoting the efforts that are being carried out by numerous institutions and groups in Mexico with three principal missions: 1) knowledge of the nation's biodiversity specifically through inventories, networks and databases; 2) sustainable use; and 3) dissemination of information on biodiversity to the public.

Because CONABIO has a promotion and coordination role, the largest part of its resources are channeled to support studies and projects of existing institutions or groups. Priorities are established through consultations with experts or interested organizations. CONABIO has made possible various meetings of the directors of the most important research institutions and of some of the most important international and Mexican experts on issues related to their areas of expertise.

Secretariat of Health- SSA

General Division for Environmental Health

Assigned to the Undersecretariat of Sanitary Regulation and Promotion, the General Division for Environmental Health of SSA has been assigned the following responsibilities, among others: to determine the maximum concentration levels of dangerous and specific environmental contaminants permissible for humans; to establish and coordinate the oversight system and the certification of water quality; to issue standards and criteria and guidelines for environmental and occupational health and basic sanitation; to exercise sanitary control and oversight of health standards in establishments where toxic and hazardous agents represent a health risk; to establish priorities concerning environmental health impact studies; to exercise sanitary control and oversight in the processes of import, export, and final disposition of pesticides, fertilizers, and toxic substances that pose health risks; and promote the development of educational activities on environmental health.

Secretariat for Social Development - SEDESOL

SEDESOL, through its Division of Infrastructure and Equipment (DGIE), as the central authority for infrastructure, has the following responsibilities (from the *Diario Oficial de la Federación*, December 28, 1995).

"Develop studies and projects as well as participate in the promotion of efforts, public works, and services related to infrastructure and equipment, to support regional and urban development and the general welfare of the public."

"Provide technical assistance to state and municipal governments and organized civic groups in training and capacity building in the operation, administration, and functioning of programs for urban and regional investment in infrastructure, equipment, and the well-being of the public; also assist in the integration and development of the necessary studies and projects."

"Track actions, public works, and services involving the state and municipal governments arranged with the private sector and coordinated by the federal government in the area of urban infrastructure and equipment."

"Establish technical standards and guidelines related to urban infrastructure projects and equipment."

"Participate in the administration of credit designated for urban infrastructure, equipment, and the general public welfare, as well as establishing the necessary mechanisms for control and evaluation."

"Function as the technical agent for financial and credit funds designated for the implementation of public works and services in the area of infrastructure and equipment, to assist in regional and urban development and the general public well-being," and

"Formulate and apply, in coordination with the appropriate federal, state and municipal authorities, regulations for awarding contracts and granting concessions related to the provision of public services whose investments come from or complement federal funds or credit endorsed by the federal government."

Secretariat of External Affairs - SRE

In accordance with the stipulations of the Organizational Law of the Public Federal Administration, the Law of Treaties, and the internal regulations of SRE:

SRE has the responsibility of promoting, providing, and assuring the coordination of actions of the agencies and entities of the Federal Administration, in accordance with their authorities, in all forums in which there is an international impact, as well as being involved in all types of treaties, agreements, and conventions of which Mexico is a party.

In the same manner, SRE is charged with participating in the negotiations of all types of international agreements related to the territorial and maritime boundaries of the country and assuring the application of and compliance with the agreements. Additionally, the Chancellery of Border Environmental Affairs is responsible for assisting in the coordination of cooperative border programs, within its limits of authority and in consultation with the appropriate authorities, to protect and improve the environment and to make good use of transborder natural resources and international rivers, as well as participating in the negotiations of the corresponding international agreements.

Through the Director General for North America and the Mexican section of the IBWC, the Chancellery is authorized to contribute, in coordination with the appropriate management authorities, criteria for the development of cooperative border projects and assist in their implementation.

Additionally, through the IBWC, the Chancellery monitors compliance of international treaties and agreements regarding the issues of defining the territorial boundaries, accounting, distribution, and use of the international rivers, attention to border sanitation problems and problems of water quality in international surface and ground waters, and in the diplomatic negotiations of agreements in these issues, in coordination with the appropriate federal, state, and municipal authorities.

APPENDIX 4

Meeting the Financial Needs of Border XXI

Annual Budgets

Federal funding for implementation of all elements of Border XXI is based on annual appropriations by the U.S. Congress and Mexico's Ministry of Finance. Because of fundamental operating procedures, it is important for both governments to coordinate, to the extent possible, their resource requests to the U.S. Congress and the Mexican Ministry of Finance and report back with clear measures of success. The success of Border XXI will require continued U.S. Congressional and Mexican Ministry of Finance support.

The annual budget processes and cycles in the U.S. and Mexico differ in some important respects. In the U.S., the annual budget cycle is based on a fiscal year (FY) extending from October 1st through September 30th. In Mexico, the fiscal year begins on January 1st and ends on December 31st. Coordination of annual resource allocations for the Border XXI Program is somewhat complex since the fiscal years are not synchronized, and year-to-year resources are available to the two countries at different points in time.

To provide an overview of the EPA resources dedicated to the U.S.-Mexico border area in recent years, Table A4.1 identifies EPA funding allocations, by EPA program offices, for fiscal years 1995 (estimate), 1996 (estimate), and 1997 (Presidential Request).

Table A4.1
EPA Budget for U.S.-Mexico Program
(U.S. $ Figures in thousands)

Program	FY 1995 (Estimate)	FY 1996 (Estimate)	FY 1997 (Presidential Request)
Air[1]	$5,268.4	$5,147.6	$5,340.9
Water[2]	$151,612.1	$151,859.1	$151,957.4
Enforcement	$3,863.5	$4,202.3	$2,100.1
Policy/Planning	$184.3	$188.8	$0
Pesticides/ Toxic Substances	$239.2	$410.9	$0

Table A4.1 (continued)
EPA Budget for U.S.-Mexico Program
(U.S. $ Figures in thousands)

Program	FY 1995 (Estimate)	FY 1996 (Estimate)	FY 1997 (Presidential Request)
Research & Development	$2,777.3	$2,827.8	$2,882.3
Solid Waste/ Emergency Response	$2,732.4	$8,549.3	$7,803.6
Administrative	$679.0	$679.0	$345.7
International Activities	$7,918.0	$10,354.0	$8,399.0
Total	**$175,274.2**	**$184,218.8**	**$178,829.0**

[1] For each year, Air Program funds include $2 million for SCERP as directed by U.S. Congress.
[2] For each year, Water Program funds include $100 million for border environmental infrastructure and $50 million for Texas colonias.

In the case of Mexico, these data are organized by Workgroup for the years 1995, 1996, and the estimates requested in the *Annual Implementation Plan for 1997.*

Table A4.2
Mexican Budget Listed by Workgroup[3]

Workgroup	1995	1996	1997[4]
Environmental Information	(did not exist yet)	(did not exist yet)	$5,000[5]
Pollution Prevention	Not Applicable	$38,961	Not Applicable
Enforcement	$1.5 million	$1.5 million	$1.5 million
Emergency Response	$350,649	$947,025	$909,090
Solid and Hazardous Waste	$150,976	$499,090	$114,545
Health	Not Applicable	$289,155	$355,194
Water	$21,722,337	$52,708,311	$175,953,246
Natural Resources	$89,579	$845,532	$996,491
Air	Not Applicable	Not Applicable	$452,597

[3] Calculated in USD assuming an exchange rate of 7.7 pesos/USD.
[4] The numbers for 1997 refer only to estimates of requested resources. However, these estimates have not been approved by the Mexican Ministry of Finance.
[5] This amount could be modified if the resources requested from the World Bank are received on time. This would provide $200,000 for the entire project period, which broken out, would provide $40,000 for 1997.

Funding Needs

In the past, many comprehensive studies have analyzed the resources necessary to address the priority infrastructure problems of the U.S.-Mexico border. Some of these studies include:

- U.S. Army Corp of Engineers, *Design and Cost Estimate Report Addressing IBWC Sanitation Issues, Prepared for the U.S. Section, IBWC*, Sept 1992.
- Melcer, Carlos; Benjamin Darche; and others, *Analysis of Environmental Infrastructure Requirements and Financing Gaps on the U.S.-Mexico Border, prepared for the U.S. Council of the Mexico-U.S. Business Committee*, July 1993 (c.$6.5 billion for water, wastewater, solid and hazardous waste infrastructure).
- Institute for Manufacturing and Materials Management, *The Border Trade Alliance Southwest Border Infrastructure Initiative, Final Report*, Feb 1993.
- Study by the State of Texas, *Environmental Infrastructure Along the U.S.-Mexico Border in Texas and Mexico*, May 1995.
- Study by the State of California, *The North American Free Trade Agreement, Implications for California*, September 1995.

These estimates of border infrastructure needs have been generated by the private sector, NGOs and state and federal governments of the U.S. and Mexico, and they vary widely in assumptions and ranges, both within each government and across the two governments. Both governments consider the development of agreed upon estimates of the resources needed to implement the Border XXI Program an essential element for long-term planning.

To meet this challenge, over the next year, the National Coordinators of both countries will lead an effort to define, on a binational basis, the resources needed to meet the water infrastructure objectives identified in the Framework Document. This effort will require the active participation of the Water Workgroup Cochairs, the IBWC, the BECC, and the NADBank. As the Program evolves, based on the experience gained from generating water infrastructure resource estimates, the National Coordinators will lead other Workgroups through a similar process. (For more information on strategic planning, please see the Implementation Section of Chapter 1). Determining overall resource needs for implementing Border XXI does not imply that such funding will be provided by the federal government alone. Many of the objectives of the Program, especially in the area of infrastructure, will require the active involvement of the private sector. A goal of the National Coordinators is to provide incentives for public and private sector participation in Border XXI.

The following is a description of two World Bank projects that support environmental infrastructure financing in the Mexican border region.

World Bank

Northern Border Environmental Program

The Northern Border Environmental Program (NBEP), funded by a World Bank loan, is a project to aid in the development of infrastructure, environmental protection, and the strengthening of environmental management for the northern border area of Mexico.

On June 10, 1994, a contract was signed between the International Bank for Reconstruction and Development (BIRF), BANOBRAS (as the Mexican financial institution), and the Mexican federal government through the Ministry of Finance, to award a loan for the equivalent of $368 million in order to implement the Northern Border Environmental Program. The Mexican national matching funds were $394 million which makes a grand total of $762 million available for the accomplishment of the different activities approved by the Program. The Program began in 1994 and extends until 2001.

The parties involved in the contract include SEMARNAP (originally SEDESOL), as the executor, BANOBRAS, as the financial and loan agent, and the federal government as the guarantor of the loan.

The objectives of the Program are as follows:

- To improve the environmental conditions of the northern border area through the strengthening of the planning, management, and environmental oversight capacity of local governments; and

- To invest in an effective and efficient manner in priority action plans that preserve the environment, reverse the effects of past environmental degradation, and reduce environmental health risks.

The Program is being implemented by various agencies: SEDESOL, CNA, INE, PROFEPA, and state and local governments.

The Program has two components:

Institutional Strengthening:
This involves technical assistance and includes the following activities: 1) improve the institutional capacity at the federal, state, and local levels for effective environmental management; 2) accelerate progress in certain key areas (management of hazardous wastes, biodiversity and endangered species protection, and the planning and preparation of future projects).

Improvement of Environmental Services:
This component consists of an available line of credit to finance urgent infrastructure projects in several eligible border cities.

Of the total of $368 million of the World Bank loan, $97.7 million are managed by SEMARNAP, and the rest by SEDESOL and by BANOBRAS ($270.3 million, from which $25.5 was canceled).

The investment categories agreed to in the loan are:

Investment Category	Designated Amount (USD)	Percentage Financed
1) Consulting Services	$ 82,400,000	100%
2) Goods	$ 97,100,000	90%
3) Public Works	$162,400,000	50%
4) Not assigned	$ 26,100,000	
Total	**$368,000,000**	

The allocation of resources for the implementation of the Program depends on the budgetary authorization of the Ministry of Finance for the corresponding year. For this authorization, the Ministry of Finance issues an investment authorization statement which is itself subject to the same federal budgetary authorization restrictions.

It should be pointed out that the designated budgetary resources for 1995 did not match the timeline expected for the implementation of the Program. During 1995, the original budget allocation of $55 million was later modified to $29.6 million, (53.8% of the original allocation) of which $20.8 million was actually expended, (70.2% of the modified budget).

For 1996, the Ministry of Finance allotted a budget of $59 million, which to date has not been modified.

By July 1996, the total credit disbursed by the World Bank amounted to $12.3 million, of which SEMARNAP received $1.8 million. (It is estimated that by December 1996 SEMARNAP will receive $4.4 million.)

Second Solid Waste Project

In 1994, approximately 80,746 tons of waste were generated daily in Mexico (5,294 tons in the northern border zone, about 6.6% of the total). Of this amount 70% was collected and only 17.2% was disposed in authorized sites. This indicates that approximately 66,887 tons remained improperly disposed of in open dumps or discharged into bodies of water, which caused severe contamination problems.

To address this issue, SEDESOL, as the implementing agency, and BANOBRAS, as the financial institution, and the Mexican federal government as the guarantor, underwrote the credit for the 3752-ME project with the World Bank, to promote comprehensive solutions for the proper operation and closure of sanitary landfills and for the closure of open dumps. This effort, which extends from 1995 to 1999, requires a complementary financial component from the private sector.

As a precursor to the current loan, the World Bank, from 1986 to 1995, granted to the Mexican federal government a credit for $25 million, requiring equal Mexican matching funds. This allowed Mexico to devote some resources for the management of solid wastes.

This contract was renewed in 1995, for a new line of credit of $60 million, with similar conditions as before and with the equal participation of the federal, state, and local governments. This program will benefit eleven million residents throughout the country who live in cities larger than 80,000 or in priority areas.

The Second Project for Solid Waste has, among others, the following purposes: (a) improve the quality of life and public health; (b) provide administrative and technical assistance to states and municipalities to coordinate, supervise and evaluate solid waste projects, as well as strengthen the technical capacity of SEDESOL and BANOBRAS; (c) increase the solid waste technical, administrative, and regulatory capacity of states and municipalities; (d) strengthen the solid waste regulatory framework as a safeguard for the environment; (e) encourage municipal financial and administrative independence through cost recovery mechanisms; (f) promote the participation of private investors; (g) correct environmental problems and reduce public health concerns; (h) eliminate through current technology and properly designed and constructed landfills, the leaching of contamination into aquifers.

Approximately 20 cities will benefit from this effort (several of which could be from the border zone such as Ensenada, Mexicali, Piedras Negras, Agua Prieta, San Luis Rio Colorado, and Matamoros, among others), with improvements to management and collection services; construction and equipment of controlled sanitary landfills; collection and disposal of medical waste; strengthening of municipal management of comprehensive waste disposal; the recovery of costs through the installation of user fees; and increased training and technical support of comprehensive management practices.

The financing for subprojects will allow a significant reduction in the need for other financial assistance, leaving the following financial structure: 35% of financial resources at no cost to municipalities; 15% from municipal sources, and the remaining 50% as a loan at the lowest interest rates available.

North American Development Bank

The North American Development Bank (NADBank), located in San Antonio, Texas, was created by the U.S. and Mexican governments as part of the North American Free Trade Agreement process in order to serve as a financial partner and catalyst in developing environmental infrastructure along the border between the two countries. Concurrent with the establishment of the NADBank, the Border Environment Cooperation Commission (BECC) was created to ensure community participation in determining environmental priorities and to certify projects seeking financial support from the NADBank. The BECC determines whether a project that meets certain technical, financial and environmental criteria should be certified as eligible for NADBank financing. Thus, project sponsors seeking NADBank financing must first apply to the BECC for certification. (See Appendix 3 for more information on BECC.)

The NADBank and the BECC provide assistance to authorities at all levels of government in the U.S. and Mexico, as well as the private sector, concerning appropriate ways to formulate and structure the financial aspects of environmental infrastructure projects in the border region. The areas of priority for both institutions are freshwater supply, wastewater treatment, and solid waste disposal. The NADBank is focusing special attention on the small communities in the border region, which may have greater difficulty in securing the resources necessary for their environmental infrastructure. The NADBank, in concert with the federal authorities of each country, will also help administer a program for community adjustment and investment in support of the purposes of the NAFTA. This program will assist businesses that need help adjusting to a post-NAFTA economy.

The NADBank's capital amounts to $3 billion, contributed in equal parts by the governments of the United States and Mexico over a four-year period which began in 1995. Fifteen percent of this capital, $450 million, will be subscribed as paid-in capital, while the remainder will be in callable capital. To date, both governments have met their contribution commitments and the NADBank currently has capital totaling $1.5 billion, of which $225 million is paid-in capital.

The U.S. Department of Treasury estimates that NADBank operations may generate up to nine billion dollars in investments over the next ten years. It is anticipated that the NADBank resources will be supplemented with other sources of financing, including financial markets, commercial banks, institutional investors, direct private sector investment, existing governmental funds, the World Bank and the Inter-American Development Bank *(from August 1996, NADBank brochure)*.

EPA Water Infrastructure Funding for 1996

In FY 1996, EPA received $100 million for border environmental infrastructure and $50 million for Texas colonias. EPA plans to use the $100 million for several purposes: A--constructing current EPA-assisted projects; B--providing technical assistance to BECC; C--constructing BECC-certified projects in combination with other funding sources; D--providing assistance to indigenous communities; and E--providing assistance to small communities.

For category A, EPA would continue funding for ongoing EPA-assisted projects (e.g., Imperial Valley/Mexicali, Nogales/Nogales, and Rio Grande city pairs) through transition to BECC-certified projects where possible.

For category B, EPA would assist additional communities in preparing the facility planning which includes financial, technical and environmental feasibility analyses required for BECC certification, especially at the BECC Step 2 application level. EPA is planning to provide approximately $10 million to the BECC for this purpose. This technical assistance program will be particularly helpful to small communities on both sides of the border seeking to develop environmental infrastructure projects. EPA recognizes the special needs of small communities and may consider additional measures to provide assistance to small communities to help them understand and participate in the project development process.

For category C, EPA would use its funds in combination with funds from SEMARNAP, the World Bank, and other sources to make NADBank loans for BECC-certified projects more affordable. BECC/NADBank would make an initial determination of whether EPA funds are needed to make a project affordable and, if so, request that EPA consider making funds available. Upon receipt of such a request, EPA would work with BECC/NADBank to determine if the project is eligible and if funding would be appropriate. EPA would evaluate BECC/NADBank requests on a case-by-case basis, using criteria yet to be developed. EPA would work through the Water Workgroup to help establish priorities.

For category D, EPA will provide funds for drinking water and wastewater infrastructure to indigenous communities in the U.S. within 100 kilometers of the border. EPA will work with tribal governments and the Indian Health Service to administer the program.

For category E, EPA is working with the NADBank and U.S. states along the border to develop a program that addresses financial needs of small communities for drinking water and wastewater infrastructure.

APPENDIX 5

State and Municipal Decentralization and Strengthening in Mexico in the Context of Border XXI

Introduction

Strengthening of environmental management capabilities in the states and municipalities of Mexico's northern border, as well as the decentralization of certain functions which are currently under federal responsibility, are a high priority for SEMARNAP and one of the principal challenges for Border XXI. The strengthening of environmental management capabilities will require the creation of conditions, at the local level, which ensure that the process of establishing a new distribution of responsibility will not cause shortfalls in authority or services.

The process of decentralization described here is more far reaching than the simple transfer of functions from one area of government to another. In seeking that those responsible for planning, implementation, and evaluation of environmental actions are always in the levels of government closest to where the problems are generated, Border XXI attempts to move decision-making closer to the communities. Decentralization is not an end in itself, but rather a means of achieving better efficiency, equality, and democracy in decision-making.

Through decentralization, the functions and decisions which were originally under federal authority are passed to local authorities under schemes realistic for the states and border municipalities, in order to guarantee optimal functioning.

As defined by the National Development Plan (PND), the New Federalism hopes to achieve a profound redistribution of resources and opportunities: "This Plan recognizes that with all levels of the government, the federal agencies should assume shared responsibility for actions and programs to balance resources and opportunities with the idea of mitigating the disparities in the development among states and municipalities."

Under these directives, SEMARNAP has designed a strategy to further these objectives. This strategy follows the Secretariats's overall decentralization project and, in the case of the northern border, the Subcomponent for the Strengthening of State and Municipal Environmental Management under the Northern Border Environmental Program.

SEMARNAP'S Decentralization Strategy for Environmental Management

SEMARNAP has initiated an ambitious national program of decentralization of environmental management which incorporates all areas in a Network that will integrate efforts and coordinate actions accordingly. SEMARNAP's decentralization process will be subject to the particular conditions of each federal entity, particularly the will and the actual capacity of authorities or civic groups to assume the responsibilities associated with a transition to sustainable development.

In the context of the Network, decentralization is seen as a process of transferring policy responsibilities, administrative functions, and resources from federal to state governments, municipalities, and, by extension, to the private and public sectors.

The decentralization project is based on certain major criteria. First, it aims to increase efficiency through an increase in government responsiveness and the location of environmental management closer to the source of environmental problems resulting in more flexible, well-informed, and less costly environmental management. Second, it seeks to support participation and assure justice in order to realize more democratic and transparent processes, a more equitable situation for the different social sectors and greater compliance with environmental and natural resource standards. Third, decentralization implies the promotion of intergovernmental relations, a model which assumes that fundamental public activities simultaneously involve the three levels of government in an interdependent relation. This framework of interdependence is based on the principle that the local and state levels of government will resolve issues to the greatest extent possible, without intervention from higher levels of government. Finally, it is important to recognize the necessity of maintaining federal participation in situations of high risk or vulnerability, such as hazardous waste management infrastructure or the loss of biodiversity.

The completion of the aforementioned objectives assumes compliance with certain operating criteria:

A) Advance the decentralization program using the Network in which all areas of SEMARNAP participate. In this process, the regional offices study the ability of every state government and municipality or social group to comply with the conditions for decentralization of a responsibility or function. In general, these necessary conditions are the availability of an adequate legal basis, a specific responsible organization, qualified personnel, budgetary information, necessary equipment and materials, and infrastructure. As local components of the Network, a State Coordinating Group for the Decentralization Project (GCD) will be established in every state and a State Environmental Management Group (CGA) will be created.

B) Establish a Coordination Agreement between SEMARNAP and each of the states, accompanied by appropriate conventions and agreements. This agreement should determine the penalties, the reversion clauses, and the general safeguards that should be applied in case the established arrangements for the decentralization process are not met.

C) Provide support to consolidate state management capacity. In this regard, the Secretariat is analyzing possible support which could include the transfer of infrastructure and equipment, specialized equipment and materials, technical assessments, training, personnel exchange, the exchange of budgeted resources, and support in obtaining a line of credit.

D) Provide follow-up and evaluate the decentralization process. The follow-up and evaluation will include a substantive analysis (results compared to the proposed objectives) as well as an operational analysis (implementation against program and operating criteria).

To date, the participants in the Network have identified 46 federal actions for decentralization. The Subseceratary of Natural Resources has identified 7, Fisheries 5, the National Institute of Fisheries 1, the National Institute of Ecology 15, the Federal Attorney General for the Protection of the Environment 7, and the National Water Commission 11. The following is a detailed account of these actions for each of the Authorities.

AUTHORITY	ACTION
1. REC.NAT.DGF	1. Preventing, detecting, fighting, controlling and extinguishing forest fires.
DGF	2. Health diagnostic and fighting and controlling forest pests and diseases.
DGF	3. Transferring technology related to the management of forest resources.
DGF	4. Actions to incorporate owners of forest resources into forestry management and processes.
UNIRN	5. National Inventory of Forest Resources (Forest and soil).
DGRCS	6. Reforestation and revegetation.
DGRCS	7. Permits to change land use in forest territory.
2. FISHERIES	1. Management of fresh water fish resources (to decentralize in the medium term). 2. Granting commercial fishing permits and fresh water sporting-recreational permits (in the medium term). 3. Rural aquaculture. 4. Aquacultural centers. 5. Aquacultural infrastructure.
3. INP	1. Aquacultural investigation.

AUTHORITY	ACTION
4. INE DGGIA	1. Pollutant Release and Transfer Registry (PRTR).
DGGIA	2. Operation of air quality monitoring equipment.
DGGIA	3. Integration of state inventories of sources of air pollution.
DGGIA	4. Environmental information.
DGRMR	5. Authorization for management of sludge from wastewater treatment.
	6. Authorization of collection centers for used oil.
DGRMR	7. Authorization for the management of used microgenerator oil.
DGRMR	8. Authorization for the management of special wastes.
	9. National park administration.
DGRMR	10. Administration of natural protected areas.
DGCAE	11. Administration of nonmigratory game species.
DGCAE	12. Distribution of stamps for hunting permits (I to IV).
DGCAE DGCAE	13. Management and instrumentation for studies of regional ecological planning.
DGIAOE	14. Evaluation of environmental impact statements of the automobile and soft drink industries.
DGIAOE	15. Issuing of operating licenses for stationary sources within federal jurisdiction.
DGRA	
5. PROFEPA	1. The measurement and control of air emissions. The management of air monitoring equipment. 2. Inspection and compliance monitoring in the area of pollution control in small and micro industries. 3. Forestry inspection and compliance. 4. Fishery inspection and compliance. 5. Inspection and compliance in the traffic of species. 6. Inspection of the Federal Maritime Land Zone. 7. Follow-up and resolution of complaints and denunciations outside the domain of PROFEPA authority.
6. CNA	1. Efficient use of water in cities. 2. Efficient use of water and energy for irrigation. 3. Strengthening of operating entities. 4. Modernization and rehabilitation of irrigation districts and sectors. 5. Studies, designs, and construction of hydraulic and protection works. 6. Clean water. 7. Aquatic underbrush in bodies of water. 8. Participation in state hydraulic planning. 9. Delimitation and control of federal zones in urban and rural areas. 10. Introduction of market mechanisms and strengthening of the Watershed Advisory Councils. 11. Irrigation districts.

The Strengthening of State and Municipal Environmental Management of the Northern Border Environmental Program

The Northern Border Environmental Program is an environmental program for the region based on credit from the World Bank and resources from federal, state, and municipal entities that function as credit partners. The Subcomponent for Strengthening State and Municipal Environmental Management managed by INE is intended to strengthen the environmental authorities of all the border states and of the ten largest border municipalities through personnel training, the provision of equipment for the control and prevention of environmental pollution, and specific studies which permit the development of an environmental development strategy. This Subcomponent has a budget of $24 million (USD) for the next five years.

The project will support efforts to strengthen the following:
a) state offices of ecology;
b) state and municipal environmental legislation;
c) analytical, diagnostic, and environmental quality monitoring capacity;
d) capacity for integrated planning for development; and
e) shared social responsibility in environmental management.

The environmental studies and action plans for the states of Sonora, Chihuahua, Coahuila, and Tamaulipas as well as the municipalities of Ciudad Juarez, Chihuahua; Nogales, Sonora; Nuevo Laredo, Tamaulipas; and Matamoros, Tamaulipas have already received the "No Objection" approval from the World Bank in the last trimester of 1995. These states and municipalities have already, during 1996, begun to use these resources. Also, the studies and action plans for the state of Baja California and the municipalities of Tijuana and Mexicali, Baja California and San Luis Rio Colorado, Sonora have recently obtained the "No Objection" approval.

Towards an Integrated Decentralization Strategy for Border XXI Program

Border XXI draws upon the central concepts put forth in SEMARNAP's "Strategy for the Decentralization of Environmental Management" and applies them to the border region. In particular, Border XXI presents a model which attempts to identify communication channels and coordination mechanisms that foster compatibility between federal government proposals, capabilities, and resources, and the concerns and demands of local governments. It seeks to harmonize federal proposals with local capabilities through specific agreements with border states and municipalities.

As progress towards the signing of the Coordination Agreements with the border states is being made, the Subcomponent for Strengthening of State and Municipal Environmental Management of the Northern Border Environmental Program will be establishing the foundation of institutional infrastructure to realize the goals of decentralization. The intention is to strengthen the technical and institutional capacity of the states and municipalities, so as to enable them to exercise the

responsibilities assigned to them by law, as well as the new functions which will be conferred on them from the federal level through the Coordination Agreements.

The evolution of the Border XXI Program will be under the following four fundamental strategy directions:

1. Resolve critical structural issues and carry out organizational obligations identified under the current scope of environmental management in the states and municipalities in the northern border.

Critical Structural Issues/ Organizational Obligations	Response
• Need to focus attention on international affairs.	• Creation of regional subgroups in which states and municipalities are involved as participants in the binational groups.
• Lack of commitment and participation by other sectors and levels of government.	• Revisions to legislation to give more legal authority to the states and municipalities.
• Confusion in the community regarding the area of competence of each level of government.	• Generalized delegation of implementation to states and municipalities based on the strengthening of environmental management.
• Lack of a human resources strategy and existence of budget and personnel policies with a high level of organizational efficiency.	• Revaluation of human resources and modernization of the structure of environmental management in the states and municipalities.
• Lack of a plan for decentralization of management.	• Development of planning studies for state and municipal environmental management.
• Excessive attention to urgent issues, to the detriment of established priorities.	• Change the tendency of excessive attention to immediate emergencies through planning activities and systematization of processes.
• Minimal availability of basic and technical equipment.	• Equipment and training of the state and municipal environmental management authorities.
• Absence of efficient mechanisms to follow up on the development of key processes.	• Establishment of indexes and measures of performance.

Critical Structural Issues/ Organizational Obligations	Response
• Limited progress in the automation of operating processes.	• Development of environmental and geographical information systems in the states and municipalities.
• Fragmented vision and little systematic focus on the fundamental operating processes in state and municipal environmental management.	• Introduction of the work methodologies of the ISO-14000 standards.

2. Establish the foundations for the development of planned and participatory environmental management.

- All the agents and essential sectors should participate in the definition of the direction for state and municipal environmental management in the northern border.
- The creation of a unit to integrate the action plans of the northern border states and municipalities will be necessary.
- Implementation should be delegated to states and municipalities.
- A specific mechanism to improve the involvement of industries and universities in environmental management should be created.
- Intersectorial coordination will be restored as a key element to achieve the incorporation of environmental issues into the policies of the Federal Public Administration.

3. Focus on objectives with a perspective which considers time and multiple coverage.
- Work on environmental problems in short, medium, and long terms.
- Local and regional coverage.
- Formulation of actions specifically oriented towards the solution of strategic and priority problems through the application of systematic and exhaustive efforts.

4. Strengthen local environmental response capacity with regard to concerns that fall under local authority and assemble the elements necessary to assume new responsibilities which are currently under federal authority.
- Strengthening of the state and municipal agencies responsible for environmental management.
- Strengthening of municipal and ecological planning capacity.
- Strengthening of capacity for identification, environmental diagnosis, and resolution of environmental problems.
- Strengthening of citizens' participation in environmental management.

Decentralization in the Context of Border XXI

In terms of water concerns, legal and regulatory barriers prevent local authorities and water administrators in border cities from addressing needs such as drinking water quantity and quality, treatment plants for wastewater, and sewers. In this regard, the laws of the border states are significantly outdated and lead to inadequate rate policies, restrict the framework for supporting investments or grants in sanitation works, cause an absence of graduated cost strategies for wastewater dischargers, and place legal restrictions on local water district administrators which prevent them from, among other things, directly receiving external financing.

Under Border XXI, existing legislation will be revised to give more legal authority to state and municipal administrators. Specifically, a new legal framework will be established for each border government entity to provide administrators with the authority necessary to meet their responsibilities, permit them to receive direct external financing (particularly from NADBank), and facilitate private sector investment in drinking water, sanitation, and sewage systems.

The decentralization of air monitoring activities in the border states and municipalities represents a major benefit for these communities. The federal government is committed to this effort. The participation of ever greater segments of society and local authorities in air monitoring responds to the general demand for access to information by those directly affected by environmental concerns. In the near term, it is feasible that the allocation of equipment as well as the development of the capacity required to carry out these efforts will be initiated. Nevertheless, support for the development of financial schemes which will allow for efficient, reliable, and sustainable operation and maintenance of quality air monitoring programs by the municipalities involved must be provided.

In this context, the pilot subgroup of local participants representing nongovernmental organizations (NGOs) and academics, as well as representatives of state and municipal governments, constitute the Binational Committee for Air Quality in El Paso-Ciudad Juarez. Similar committees may be formed later in other regions along the border.

Although the management and disposition of hazardous wastes is currently under federal jurisdiction, within the Border XXI Program the involvement of states and municipalities in all activities that pertain to the tracking and the control of such wastes, including consultation with local communities on the identification of possible locations for the establishment of waste disposal and recycling centers is contemplated. SEMARNAP intends to differentiate hazardous wastes in terms of high or low risk factors, a process which may eventually result in more direct participation by state governments in the management of such wastes.

Environmental education, pollution prevention, and emergency response actions are activities for which local authorities should have direct input to Border XXI. Although it is possible to preserve the current structure and the existing federal scope of the workgroups in order to carry out negotiations and address issues of overall coordination with our U.S. counterparts, specific actions

and operations should be in the hands of those most directly impacted. To this end, as a general strategy it is contemplated that regional subgroups which will be integral parts of the binational workgroups will be created to involve states and municipalities.

Within the Cooperative Enforcement and Compliance Workgroup two local subgroups were created, one formed by California and Baja California and the other incorporating Texas, New Mexico and Chihuahua.

The growing participation of state governments represents an opportunity to think about decentralizing conservation and development of natural resources, in particular the management of wild flora and fauna in natural protected areas. This will be one of the priorities of the Border XXI Program.

The preceding ideas are only some of the possibilities for advancing along the path toward decentralization of environmental management in the northern border region. Refinement of these ideas and the momentum for their definition, depends in each case on the political will and the technical and institutional capacity of each local government, along with a clear decision by federal environmental authorities to transfer responsibilities and the corresponding resources.

APPENDIX 6

Southwest Center for Environmental Research and Policy

Project Name: **Cooperative Agreement with the Southwest Center for Environmental Research and Policy (SCERP)**

I. Purpose and Objectives: EPA's FY 1996 appropriation included "$2,000,000 for the Southwest Center for Environmental Research and Policy." EPA's objective with this cooperative agreement is to provide for the improvement of the health and environment along the U.S.-Mexico border. Since no media focus (i.e. air, water, waste, etc.) was specified by the appropriation language, SCERP and the Office of Air and Radiation will pursue efforts in most, if not all, media.

II. Amount of Money Invested and Recipient of Funds: $2,000,000 congressionally directed to SCERP. An additional $100,000 is provided by the recipient as a 5 percent matching contribution.

III. Partners in the Project:

SCERP Institutions:
- University of Utah
- San Diego State University
- University of Texas, El Paso
- New Mexico State University
- Arizona State University

SCERP Partners:
- Instituto Tecnológico y de Estudios Superiores de Monterrey
- Universidad Autónoma de Baja California
- Instituto Tecnológico de Ciudad Juárez
- Universidad Autónoma de Ciudad Juárez
- Office of Air and Radiation, U.S. EPA
- Region 6, U.S. EPA
- Region 9, U.S. EPA

IV. Description: Under a cooperative agreement with EPA, SCERP institutions are conducting 20 projects that address health and environmental problems of the border region. The projects were selected through a competitive process involving individuals form SCERP's management committee, EPA Headquarters, and EPA Regions 6 and 9. Some of the projects focus on one media while others may be multimedia in nature (e.g. both air and water). The agreement covers a one-year period.

V. Current Status: The cooperative agreement is in place, and individual project proposals of the grant have been approved and are underway through a pre-award agreement.

VI. Schedule: The one-year project period of this agreement is expected to begin in late July, 1996 and continue for one year.

For additional information on SCERP and SCERP projects please, visit SCERP's World Wide Web homepage at http://www.civil.utah.edu/scerp/ . Also SCERP's 1995 programs are listed in EPA's publication *Compendium of EPA Binational and Domestic U.S./Mexico Activities.*

APPENDIX 7

Border XXI Community Grant Projects
U.S.-Mexico Border Region

Last fall, EPA awarded a total of 14 Border XXI Community Grants, each for up to $35,000 in funding for communities in the U.S.-Mexico border region. EPA's Office of International Activities initiated the grant program to strategically address environmental issues in the U.S.-Mexico border region by strengthening local capacity at the community level. As part of EPA's "place-based" environmental decision-making initiative, these grants will assist border communities to respond to environmental and related health needs particular to their situation and location in the border area. The work that will be accomplished through these grants will provide valuable public input into the development of Border XXI.

EPA has awarded these Border XXI Community Grants to empower the various sister-cities and border communities of California, Arizona, New Mexico, and Texas; and as a means of identifying their specific needs and priorities and facilitating more effective coordination with local, state and federal governments. All of these grants have a one-year project period for completion and EPA's Office of International Activities expects to meet with all of the grant recipients next year to review the results of these projects and assess their input to the U.S.-Mexico border program.

The attached table provides the project names, locations, grant recipients, points of contact, and project summaries for the Border XXI Community Grants which have been awarded by EPA. For further information regarding the Border XXI Community Grants, please contact one of the EPA offices listed below.

EPA Contacts

Office of International Activities:	Lorry Frigerio (202) 260-6623
	Pam Teel (202) 260-4896
San Diego Border Liaison Office:	Brent Maier (619) 235-4767
	Colleen Smith (619) 235-4768
El Paso Border Liaison Office:	Marvin Waters (915) 533-7273

BORDER XXI COMMUNITY GRANT PROJECTS U.S.-MEXICO BORDER REGION

PROJECT NAME - LOCATION	GRANT RECIPIENT CONTACT/TELEPHONE NO.	PROJECT SUMMARY
Cochise County - Northeast Sonora Planning Project Cochise County, AZ	Arizona Toxics Information Contact: Nicola Zeuner at (520) 432-5374.	Project addresses hazard prevention and reduction through binational training of community planners.
Ambos Nogales Environmental Action Plan Nogales, AZ; Nogales, Sonora	City of Nogales, AZ Contact: Michael Hein or Lorena Lopez at (520) 287-6571.	The Ambos Nogales Environmental Committee will host six one-day conferences or workshops, establish an environmental information center in Nogales, AZ and Nogales, Sonora, and develop a public outreach program.
Environmental Priorities, Needs, and Solutions in the San Diego/Tijuana Border Region	Environmental Committee of the San Diego-Tijuana Region of the United Nations Association; the Border Progress Foundation; Institute for Regional Studies of the Californians, San Diego State University; San Diego-Tijuana Binational Environmental Task Force Contact: Paul Ganster at (619) 594-5423, Kaare Kjos at (619) 285-1725 or Elsa Saxod at (619) 291-1574.	Establish a proactive environmental and infrastructure planning process through public outreach by creating a binational San Diego-Tijuana Environmental Task Force, including members of the business, government, and environmental communities.
Mariposa Community Health Center Nogales, AZ; Nogales, Sonora	Mariposa Community Health Center Contact: Maria Jesus Arevalo at (520) 281-1550.	Project focuses on reducing, reusing and recycling household solid waste, including hazardous waste, in Ambos Nogales; and the design and implementation of a binational household solid waste program in Ambos Nogales.
Sonoran Institute: Series of Border Community Workshops/Forums Western Sonoran Desert	Sonoran Institute Contact: John Shepard or Juaquin Murrieta at (520) 290-0828.	Community workshops and forums throughout southwestern Arizona-northwestern Sonora and Baja to develop regional consensus on shared priorities and a Western Sonoran Desert Border Plan.

BORDER XXI COMMUNITY GRANT PROJECTS U.S.-MEXICO BORDER REGION

PROJECT NAME - LOCATION	GRANT RECIPIENT CONTACT/TELEPHONE NO.	PROJECT SUMMARY
Tijuana River Watershed Toxics Data Project	Arizona Toxics Information Contact: Michael Gregory at (520) 432-5374.	Identify sources and develop criteria for toxics data on both sides of the border required for GIS mapping of the Tijuana River watershed. Facilitate interface of GIS project personnel with toxics decision makers in Mexico; and develop outreach materials and activities to facilitate transborder dialogue.
Building a Kumeyaay Environmental Strategy: A U.S.-Mexico Border/Frontera 2000 Community Planning Project	Campo Band of Mission Indians, Campo, California Contact: Michael Connolly or Fidel Hyde at (619) 478-9369.	Development of a water quality control plan to measure water quality trends as well as a cross-border planning mechanism to enhance long-range environmental protection of the natural resources on Kumeyaay/Kumiai community/Reservation lands.
Environmental Plan of Los Dos Laredos Laredo, Texas; Nuevo Laredo	City of Laredo Contact: Marina Sukup, Keith Selman or Mary Mahoney at (210) 791-7464 or (210) 791-7441.	Creation of a bi-national environmental plan for Laredo, Texas, and Nuevo Laredo, Tamaulipas. The environmental plan will address environmentally sensitive issues between the sister cities for the next 20 years.
Ayuda's Selfhelp Community A.I.R.E. Project San Elizario, Texas	AYUDA: Adults and Youth United Development Association Contact: Rosario Saenz at (915) 851-0272.	Creation of a long range community action environmental plan for this "colonia" area. Incorporates public input through meetings, local interest campaigns, environmental fairs, and a special focus on youth activities. Project will include a pilot process for individual septic tank acquisitions.
Environmental Improvement Plan, City of Donna, Texas	City of Donna, TX Contact: Robert Diaz de Leon at (210) 464-3314.	Development of a long-term environmental plan including public input and the incorporation of pollution prevention.
Environmental Improvement Plan, City of Progresso, Texas	City of Progresso, TX Contact: Arturo Valdez at (210) 565-0241.	Multi-media infrastructure approach to environmental issues such as potable water, surface damage and solid waste in a recently incorporated "colonia" located in the lower Rio Grande Valley area.

BORDER XXI COMMUNITY GRANT PROJECTS U.S.-MEXICO BORDER REGION

PROJECT NAME - LOCATION	GRANT RECIPIENT CONTACT/TELEPHONE NO.	PROJECT SUMMARY
An Ecological Baseline Model for the U.S.-Mexico Border Region Columbus, New Mexico; Palomas, Chihuahua	The Environmental Finance Center, New Mexico Engineering Research Institute, The University of New Mexico Contact: Heather Hummelburger at (505) 272-7357.	Establish an ecological baseline in the area of Columbus, New Mexico and Puerto Palomas, Chihuahua, two communities located approximately 70 miles west of El Paso-Ciudad Juarez.
Environmental Improvement Plan for Southwest Webb County, Texas	County of Webb, Texas Contact: Juan Vargas at (210) 718-8601.	Development of an overall environmental improvement plan which will include 3 large "colonias".
Environmental Cooperation and Community Building along the Rio Grande at Big Bend National Park	National Parks and Conservation Association Contact: David Simon at (505) 247-1221.	Community outreach workshops, creation of a regional council with representatives from the communities, land management entities, and major stakeholders to serve as a forum for environment/development issues. Also planned is an extension program to address range management issues impacting Big Bend National Park's environment.

APPENDIX 8

Social and Economic Overview of the U.S.-Mexico Border

The U.S.-Mexico border area, defined as the area within 100 km on either side of the international boundary includes four U.S. border states and six Mexican border states. Along the international boundary, this includes 39 Mexican municipalities, 25 U.S. counties and 14 pairs of sister cities. This area stretches almost 3000 km from the Pacific Ocean to the Gulf of Mexico. Many other U.S. counties and Mexican municipalities are located entirely or partially in the 200 kilometer zone but are not adjacent to the international boundary.

The international boundary defines not only the political jurisdictions of the two countries but also distinguishes two nations with distinct social, cultural and political features. At the same time, the border area emerges as a space in which these differences converge and become less distinct. Some of the defining characteristics shared by border communities are:

a) the intense interrelationship between communities on both sides of the border;
b) the rapidly growing population;
c) the strong presence of new economic factors, such as maquiladoras, with a high social, economic, and environmental impact; and
d) the constant transboundary movement of people, goods, and resources.

The Border XXI Program attempts to address and find solutions for specific infrastructure and environmental protection needs within the socioeconomic and cultural context particular to border communities.

Population

The border region is currently home to more than 10.5 million people with about 6.2 million in the U.S. (59 percent) and 4.3 million in Mexico (41 percent).

Almost 90 percent of the border population lives in urban areas. For the most part, these urban areas are sister city communities composed of a U.S. and Mexican city closely related by proximity, commerce, and shared resources. The sister cities are the main points of commercial and human transboundary movement and are the industrial centers of the region.

The sister cities of San Diego and Tijuana have a population of more than 3.5 million people and El Paso and Ciudad Juarez have more than 1.5 million. Six other sister city pairs have combined populations of over 150,000 each: Imperial Country-Mexicali, Laredo-Nuevo Laredo, McAllen-Reynosa, Brownsville-Matamoros, Nogales-Nogales and Yuma-San Luis Rio Colorado. The region of California-Baja California, including the counties of San Diego and Imperial and the municipalities of Tijuana, Tecate, and Mexicali, alone makes up 44.5 percent of the total population in the border area, while the area of El Paso-Ciudad Juarez makes up 15.4 percent of the border area's total population. Most other parts of the border area are sparsely populated with several counties and municipalities having fewer than ten persons per square mile (approximately 4 persons/km^2).

Population growth on both sides of the border has been noticeably rapid, growing far faster than that of the population as a whole in either country. In the border area of Mexico, the growth rate is 3 percent (the fastest growing municipalities are Tijuana with 5%, Nogales 4.9%, and Ciudad Juarez 4.5%) and in the U.S. border area the growth rate is 2.7 percent. Between 1950 and 1980, the population of the Mexican border states tripled and that of the U.S. border states doubled. The birth rate in 1990 for the Mexican border states (27.6 births/1000 people) was less than the national average (32.2 births/1000 people); however, according to the 1990 U.S. census, the birth rate in the U.S. border states (19.1 births/1000 people) is higher than the national average (16 births/1000 people). The differences in the birth rates in both regions may reflect cultural and economic differences between the border region and their respective countries, but also may reflect a common influence between the two communities.

Life expectancy in the Mexican border area is higher than the national average. In 1992, life expectancy in the Mexican border states was 70.3 years. In the U.S. border area, life expectancy in 1990 was 75.4 years, almost the same as the U.S. national average of 75.5 years (1992). Mortality rates in the Mexican border states are slightly below the national average; similarly mortality rates in U.S. border states are slightly lower than the national average. However, it is worth noting that in border municipalities with a large migratory influx there is a high rate of infant mortality.

Despite recent setbacks in the Mexican economy, expected long-term economic growth in the border region is likely to stimulate continued rapid population growth in the area. Current population projections forecast a doubling of the border population over the next 20 years.

The U.S. border area is more ethnically diverse than the rest of the country with about 57 percent of the border population consisting of ethnic minorities, versus about 20 percent in the U.S. population as a whole. For example, in El Paso 69 percent of the population is Latino (Hispanic), as is 90 percent in Brownsville. More than 97 percent of the Starr County (Texas) population is Latino (Hispanic). Ten of the 25 U.S. counties with the greatest number of people born outside the U.S. are in the border region. Spanish is the dominant language of many U.S. border communities.

Income, Employment, and Quality of Life

The six Mexican border states have poverty rates considerably below the national average, with the exception of Tamaulipas which has a rate closer to the national average ('poverty' as defined by Mexico). These Mexican border states also tend to have a more uniform income distribution than for Mexico as a whole. At the municipal level, this equity in income distribution is even more evident. However, these communities confront deficiencies in the provision of basic services and have more unmet needs than the national average.

The U.S. border population, on the other hand, tends to be poorer than the rest of the country with more than 20 percent living below the poverty level as compared to 12 percent in the country as a whole ('poverty' as defined by the U.S.). There are big differences in income along the U.S. border. About 8 percent of San Diego, California's population is below the poverty line while in Starr County, Texas about 55 percent of the population lives in poverty. Three of the ten poorest counties in the U.S. are located in the border area and 21 U.S. border communities have been designated as economically distressed.

In terms of employment, in Mexico many of the manufacturing jobs and associated service jobs reflect the effect of Mexico's maquiladora program which was created in the mid-1960s. The program grew significantly during the 1980s as a result of Mexico's peso devaluation which lowered salaries and made industrial development on the Mexican side of the border attractive. An increase in maquiladoras also occurred in 1995 because of the 1994 peso devaluation. From fewer than 100 maquiladoras nationwide in the 1960s, by December 1995, there were more than 2000 businesses employing more than 600,000 workers, with 89 percent located in the northern border area of Mexico (around 550,000 employees). These industries represent the second largest source of export earnings in Mexico. The largest concentrations of maquiladora plants are in Tijuana with 515 plants employing 95,500 employees and Ciudad Juarez with 263 plants employing more than 150,000 people.

The effect of border municipalities on Mexican national economic indicators is significant, especially in the areas of employment and goods purchased. Also, these border municipalities have a concentration of 11.6 percent of the national industrial manufacturing workers.

Manufacturing activity, the second economic sector, employs 28 percent of Mexico's economically active population. For the border states this number is greater than the national average (except for Sonora, in which manufacturing activity employs 25% of the economically active population). In Mexico, the manufacturing activity of the border region is concentrated in the municipalities of Ciudad Juarez, Chihuahua; Tijuana and Mexicali, Baja California; Matamoros and Reynosa, Tamaulipas; and Nogales, Sonora. These municipalities contribute 83 percent of the jobs generated in the border region, contribute 87 percent of the total production in the region, and 85 percent of the value added in the region.

In both countries, the percentage of the population engaged in agriculture is generally lower than in the rest of the country; although in a few border counties, primarily in the lower Rio Grande area and Imperial County, California, agriculture is important.

Education

The Mexican border states have better access to education and their education levels are higher than the national average. For example, in Nuevo Leon and Sonora about 90 percent of the population ages 5 to 14 have access to education. Data on the percentage of the population considered to be without schooling shows about 18 percent at the national level versus less than 10 percent in the border area.

In the U.S., there are great variations in levels of education among border counties. For example, over 90 percent of the population in San Diego, California, have completed nine years of school while only 52 percent of the population in Maverick, Texas has done so. Similar data on the percentage of the population who are high school graduates show about 82 percent of the population of San Diego County as having earned high school diplomas while only 20 percent of the population in Zapata, Texas has graduated from high school.

Colonias

Colonias are U.S. rural settlements with substandard housing and poor living conditions along the U.S.-Mexico border. Colonias are found mostly in New Mexico and Texas; it is estimated that over

390,000 people in Texas and 42,000 people in New Mexico live in them. These communities often lack basic services of potable water, wastewater treatment, drainage, electricity, and paved roads. The federal government and the states of Texas and New Mexico have undertaken steps and are exploring new ways to address the problems of colonias.

The information contained in this appendix was drawn from the following sources:

1. U.S. Department of Commerce, Bureau of the Census, Government Printing Office, *County and City Data Book 1994*, Washington D.C., 1994.

2. The Colegio de la Frontera Norte, *Social and Economic Structure of the Northern Border*, Feb 1995.

3. Instituto Nacional de Estadística, Geografía e Informática, *Collection of Annual Statistics for the Northern Border States*, 1994.

4. Instituto Nacional de Estadística, Geografía e Informática, *The XI General Census Volumes I and II s, Northern Border Basic Tabulated Information*, 1990.

5. National Center for Health Statistics.

6. Ganster, Paul and Alan Sweedler, "The United States-Mexican Border Region: Security and Interdependence," in David Lorey, ed., United States-Mexico Border Statistics since 1900 (Los Angeles: UCLA Latin American Center, 1990)

7. Report of the Public Advisory Committee, *State of the U.S.-Mexico Border Environment*, September 1993.

8. U.S.EPA and Lockheed, *The U.S. Mexico Border Environment Report--Surface Water Quality (Draft)*,.

9. Texas Water Development Board, *Colonias Needs Survey* (executive summary).

10. *Twin Plant News*, June 1996.

11. Suárez y Toriello, Enrique and Chavez Alzaga Octavio, *Perfil de la Frontera Mexico-Estados Unidos*, FEMAP, 1996.

APPENDIX 9

Summary of Health Impacts From Air Pollution Criteria Pollutants (O_3, CO, SO_2, PM-10, lead, and NO_x)

Many border residents are currently exposed to health-threatening levels of air pollution. Ozone, carbon monoxide, sulfur dioxide, particulate matter, oxides of nitrogen, and lead are among air pollutants of concern in the border region.

Ozone causes lung damage and reduced respiratory function in as short a time as one hour. Ozone oxidizes the soft passages of the nose, mouth, and throat causing coughing, choking and eye irritation. In addition, ozone can make the lungs brittle which reduces people's ability to breathe. This limited lung capacity can aggravate preexisting respiratory conditions, such as asthma, to dangerous levels and even in healthy people reduces resistance to disease.

Particulate matter is a complex mixture of soot, ashes, dirt, dust, pollens, molds, and other carbon-based particles and acid aerosols. Sources include motor vehicles, mining, construction activity, agricultural activity, unpaved roads, electric power generation, boilers, home heating systems, wood burning and waste combustion. The small particles inhaled deeply into human lungs are especially harmful to people with asthma and chronic pulmonary disease. High levels of exposure to PM-10 (particles less than 10 microns in diameter) are associated with increased emergency hospital visits and hospital admissions as well as premature deaths. Tens of thousands of deaths every year in the United States are associated with particulate air pollution.

Carbon monoxide is a colorless, odorless, poisonous gas which displaces oxygen from the blood and thereby reduces brain and muscle activity. Carbon monoxide is fatal at high doses. Sources of exposure include motor vehicles, gas and wood stoves, faulty heaters, and passive tobacco smoking.

Sulfur dioxide is produced by the burning of sulfur-containing impurities in fossil fuels. Sources include large utility and industrial boilers, smelters, numerous small coal and oil combustors and emissions from heavy-duty vehicles (e.g., trucks, buses). Health effects include increased broncho-constriction in asthmatics to an extent that may be perceived as a mild asthma attack and respiratory symptoms (e.g., wheezing, chest tightness) in asthmatics.

Oxides of Nitrogen, including nitrogen dioxide and nitrogen oxide, are products of combustion and are potentially dangerous to human health. Nitrogen oxide is not an irritant at normal ambient concentrations and is not considered detrimental to health. When it converts to nitrogen dioxide in the environment, it becomes more damaging, causing nasal irritation, respiratory discomfort, breathing pain, and fluid accumulation in the lungs. The sensory threshold in humans for this gas is from 1 to 3 parts per million (ppm). An ambient concentration above 100 ppm is lethal.

Lead is one of the heavy metals that becomes widely diffused and is readily inhaled into the body when it is used as a fuel additive for gasoline, among other uses. Lead ingestion can lead to acute

toxicity or can be permanently accumulated in bones, teeth, and the circulatory system. Only 5 to 10 percent of the lead ingested by humans is absorbed into the body, while between 30 and 40 percent of the lead taken in while breathing reaches the blood stream through the lungs. A concentration of 120 micrograms of lead per 100 milliliters of blood is considered hazardous.

APPENDIX 10

Ongoing U.S. State and Local Hazardous and Solid Waste Projects

California

The California Department of Toxic Substances Control (DTSC) Border coordinator, through an EPA grant, and other DTSC staff carry out a variety of U.S.-Mexico border projects including tracking movement of hazardous waste shipments across the state border, providing training on California requirements for hazardous waste management and shipping, coordinating efforts by San Diego and Imperial counties, providing technical assistance to Mexico upon request, and supporting federal prosecutors' and local District Attorneys' investigations and enforcement cases as needed.

Staff of the San Diego County Hazardous Materials Management Division (HMMD) conduct investigations of import/export of hazardous waste shipments between California and Mexico for conformance with applicable laws and regulations. Investigations focus on the Otay Mesa, San Ysidro, and Tecate border crossings, and involve close coordination with U.S. Customs and the California Highway Patrol. County staff also conduct training on the basics of hazardous waste labeling, recognition, documentation, handling and transportation.

Cal-DTSC has provided an on-site inspector to assist the Imperial County Health Department in its hazardous waste enforcement and compliance efforts. The Cal-DTSC inspector conducts unannounced truck stops at the border crossing in Calexico; conducts investigations of suspicious waste shipments as requested; responds to complaints regarding waste management in the county; conducts enforcement actions resulting from truck stops and complaint investigations as necessary; provides technical support for criminal investigations in the county; provides training on hazardous waste regulations, inspections, and sampling techniques to Customs and other government officials in Imperial County; and participates in California border workgroups.

Arizona

The Arizona Department of Environmental Quality (ADEQ), through funding support from EPA, is conducting surveys of small quantity and conditionally exempt small quantity hazardous waste generators along the border as part of a broader effort to develop a multimedia industrial source inventory. ADEQ is collecting data on raw materials, industrial processes, control technologies, and waste handling practices of industries along the border. The data will be used to track and manage hazardous waste disposal in the region. ADEQ has also conducted preliminary site assessments in the border area. Sites were evaluated for evidence of possible hazardous substance releases and potential impacts. Preliminary assessments and site inspections were conducted through a mutual agreement with the EPA under the Superfund program.

New Mexico

New Mexico's Environment Department Hazardous and Radioactive Materials Bureau (HRMB) will develop the Santa Teresa Border Crossing project, an enforcement plan to be in place when the new border port of entry opens in 1998. The plan will draw from existing efforts and experience from PROFEPA, EPA, TNRCC and other border authorities.

Texas

The state of Texas will continue to conduct workshops for industry and the community covering compliance with import/export requirements, and pollution prevention opportunities with sound materials and waste management. They will also work with local border communities and local, state, federal and Mexican agencies on issues related to hazardous waste. Five TNRCC staff along the border conduct inspections at bridges, warehouses, etc., to ensure compliance with RCRA and Article III of the La Paz Agreement along the Texas - Mexico border. In addition, TNRCC's Border Solid Waste Program is currently funded by an EPA grant to facilitate compliance assurance in Texas' border region. The primary focus of this program is identifying the scope and magnitude of illegal dumping problems in this region, toward ultimately developing recommendations for feasible long-term, cost-effective solutions to illegal dumping problems. This is a particularly critical issue since many illegal dumps in this region have developed due to lack of solid waste services in many of Texas' border colonias, a situation which can also lead to health problems and water quality issues. Program staff will be working borderwide with colonia residents, regional and local government officials, NGOs and other entities to ensure workable solutions.

APPENDIX 11

Additional Sources of Information

Documents of Interest[1]

- Compendium of EPA Binational And Domestic U.S.-Mexico Activities. United States Environmental Protection Agency--Office of International Activities. EPA Publication No. 160-B-95-001. (June 1995).

- Environmental Protection Along the U.S.-Mexican Border. United States Environmental Protection Agency. EPA Publication No. 160-K-94-001. (October 1994).

- First Annual Report of the Good Neighbor Environmental Board. Report to the President, Vice-President, and the Speaker of the House of Representatives. (October 1995).

- Integrated Environmental Plan for the U.S.-Mexican Border Area (First Stage, 1992-1994). Report prepared jointly by United States Environmental Protection Agency and Secretaría de Desarollo Urbano y Ecología [Mexico]. United States Government Printing Office No.312-014/40061. (1992).

- State of the U.S.-Mexico Border Environment. Report of the United States Environmental Protection Agency, U.S.-Mexico Border Environmental Plan Public Advisory Committee. (September 1993).

- International Boundary and Water Commission Sanitation Issues: United States and Mexico. Design and Cost Estimate Report prepared by the U.S. Army Corps of Engineers, Fort Worth District. (September 1992).

- National Coordinators' Meeting (U.S.-Mexico Border), June 22-25, 1992, Santa Fe, New Mexico. Report prepared by U.S.-Mexico Border Team, U.S. Environmental Protection Agency, Region 9, San Francisco, California. (1992).

- SEMARNAP-EPA Joint Report of the U.S.-Mexico National Coordinators Meeting, Mexico City, June 20-23, 1995. Report prepared jointly by United States Environmental Protection Agency and Secretario de Medio Ambiente, Recursos Naturales y Pesca. (1995).

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[1]Most of the documents listed here are available at the Environmental Protection Agency's Border Office information centers in San Diego, California and El Paso, Texas. Some may also be available at larger public libraries, or university libraries.

- Bilingual pollution training manuals on the following industries: 1. Waste Minimization for the Metal Finishing Industry (May 1993), 2. Pollution Prevention for the Wood Finishing Industry (October 1994), 3. Pollution Prevention in the Electronics Industry (May 1996), and 4. Pollution Prevention in the Textile Industry (March 1997). All were prepared jointly by the United States Environmental Protection Agency and Mexico's Secretaria de Medio Ambiente Recursos Naturales y Pesca.

- Water Related Geographical Information Systems (GIS's) Along the United States-Mexico Border. United States Environmental Protection Agency--Office of Water. EPA Publication No. 832-B-93-004. (July 1993).

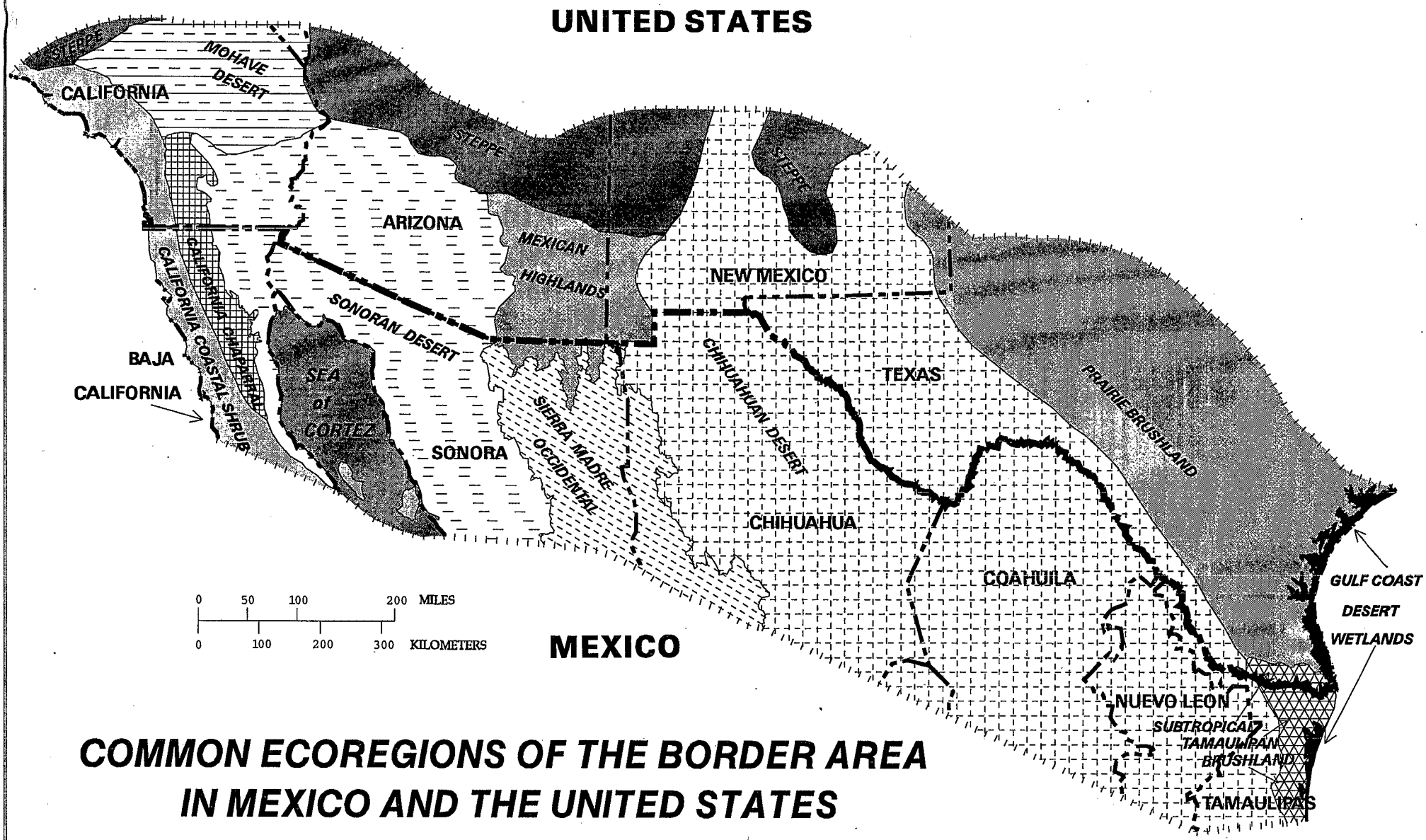
Electronic Sources of Information

Agency or Organization	World Wide Web (WWW) Home Page Address
EPA	http://www.epa.gov
DOI	http://www.usgs.gov/doi
DOJ	http://www.doj.gov
HHS	http://www.us.dhhs.gov:80
IBWC	http://www.ibwc.state.gov
SEMARNAP	http://semarnap.conabio.gob.mx
PROFEPA	http://semarnap.conabio.bob.mx/profepa
CONABIO	http://www.conabio.gob.mx
INEGI	http://www.inegi.gob.mx
SSA	http://cenids.ssa.gob.mx
CEC	http://www.cec.org
CIESIN	http://www.ciesin.org
BECC	http://cocef.interjuarez.com
NADBank	http://www.quicklink.com/mexico/nadbank
Borderlands	http://www.twinfinet.com/mader/ecotravel/border
UTEP	http://www.cerm.utep.edu
SCERP	http://www.civil.utah.edu/scerp
Colonias	http://lanic.utexas.edu/la/mexico/colonias
TRIP	http://www.glo.tx.us/infosys/gis/trip
TNRCC	http://www.tnrcc.state.tx.us
Udall Center	http://upr.admin.arizona

LISTSERVERS

- BECCnet
  - Send email to: listserv@arizona.edu
  - Your email should read: Subscribe beccnet {yourfirstname yourlastname}

- US-Mexico Border List Server :
  - Send email to: listserver@unixmail.rtpnc.epa.gov
  - Your email should read: Subscribe us_mexborder {yourfirstname yourlastname}



COMMON ECOREGIONS OF THE BORDER AREA IN MEXICO AND THE UNITED STATES

NOTE: This map is based on DOI information available at the time when this document was prepared.