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## State of the Environment: New Mexico-Chihuahua Border Region

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#### ABSTRACT

This chapter represents a summary of a larger document published by the New Mexico Environment Department titled *Bordering New Mexico: Major Environmental Issues Along the State's International Border with Mexico*. Published in late 2002, the larger document describes the significant environmental issues of New Mexico's border region organized by environmental media. Topics include air quality, groundwater, surface water, hazardous and solid waste, and a description of regional environmental health. In many respects, the original document and the summary report are identical.

A word here about the New Mexico-Chihuahua border region: Outsiders are often unprepared for the extreme poverty that exists in both Mexico and the United States in this section of the border. In Puerto Palomas, children are observed standing shoeless amid blowing trash, holding tightly to plastic containers of public well water, the only source of water for their homes. On the U.S. side of the border, families live in "illegal" housing developments that spring up overnight when aging mobile homes are clandestinely deposited in open desert. The U.S. Census Bureau reports 25% of U.S. residents living below the federal poverty level. Per capita income on the New Mexican side of the border averages merely 64% of the U.S. national average. In many respects there is no bottom to poverty in this region.

The region itself is situated at the northern end of the vast Chihuahua Desert. Characterized by rabbit brush, mesquite and creosote, this is a desert where mankind has yet to lay full claim to the land. On hot summer day, only the native rabbits and a few cattle can be seen. At night, burrowing owls, rattlesnakes, and coyote roam freely. A unique characteristic of the region is the "Sky Island" community on the far western edge of the New Mexico state line. Birdwatchers from around the world come to this region to observe the large variety of hummingbirds and tropical creatures that appear each summer in this remote, sheltered part of the border.

Along the New Mexico-Chihuahua border, water ranks as the most important limiting resource. Its significance is uncontested. More than 90% of regional communities on both sides of the border receive their water from underground aquifers. Only the Rio Grande provides guaranteed seasonal flows, mostly from Spring snowmelt that begins far to the north in southern Colorado. The Rio Grande Compact, an agreement signed in 1938 by the states of Colorado, New Mexico, and Texas and the U.S. government, annually allocates the river flow with the water proportioned according to measurable flow and historic usage.

Although the city of El Paso, Texas, to the south traditionally obtains about 40% of its tap water from treated Rio Grande water, in New Mexico, only a small portion is extracted for municipal or industrial supplies. Significantly, in New Mexico and in the northern border region of Chihuahua, there is growing concern that regional reliance on groundwater pumping is placing stress on the region's aquifers, an issue with interstate and binational implications.

Quality of water also ranks as an important environmental issue. In southern New Mexico, some 40% wells have been found to be contaminated from a variety of sources, including septic waste, agricultural production, and industrial sources. Currently, a well site within the city limits of Las Cruces has been listed as a U.S. Environmental Protection Agency (EPA) Superfund Site, because it is contaminated with perchloroethylene, a chemical used in dry cleaning and by certain industries.

As for exposures to hazardous and solid waste, the region is fortunate to possess enough capacity to handle both its hazardous and solid waste volumes. However, enforcement officials share a concern about the potential for abuse of hazardous waste regulations in light of the large maquiladora industry to the south in Ciudad Juárez. Although the New Mexico-Rural Chihuahua region is deemed at risk, so far, few industrial abuses have been discovered.

Under this topic, a more pressing concern is the lack of citizen compliance with existing solid waste disposal rules and a failure to enforce regulations for proper disposal at existing facilities. Some burning of trash and other materials in rural areas also poses an air quality issue.

Air pollution along New Mexico's border with Mexico has long been a difficult issue to address. Currently, Doña Ana County contains two small non-attainment areas that have failed to meet the National Ambient Air Quality Standards: Sunland Park for ozone (one-hour standard) and Anthony for particulate matter (PM). Both non-attainment areas are small, rural communities with few emission sources. In addition, the New Mexico Environment Department recently formed a study group to investigate high particulate, low-wind exceedances of particulate matter at the Sunland Park City Yard.

Environmental health issues remain an important consideration along the New Mexico-Chihuahua border. Many residents on both sides are not familiar with the connection between health and the environment. As a result, preventable illnesses occur because of personal behaviors that result in contamination of the environment or exposure to environmental agents. Exposure to contaminated groundwater and air pollution poses a fundamental environmental health concern, however, human exposure to pesticides and agro-chemicals has been an issue on both sides of the border. Recently, laboratories in El Paso isolated mosquitoes carrying the West Nile virus in Doña Ana County.

A current worry among border communities is how to prepare their citizens for water conservation and other measures under drought conditions. Now in its third documented year, the region suffers from mild to severe drought. El Pasoans are now allowed to water their lawns only once each week, while the city of Las Cruces has imposed restrictions on water use for the first time in its history. Furthermore, no relief for the drought is forecast this year as snowfall in southern Colorado continues to be measured at record lows.

In conclusion, most environmental issues cited in the New Mexico-Chihuahua chapter have been well-studied and are well-documented. They have, however, been difficult to address. Poverty in this stretch of the border region seems indigenous. Resources to address even the most well-researched problems are limited and few. Under such circumstances, it is reasonable and practical for the border communities of southern New Mexico and northern Chihuahua to seek outside assistance from their governments or private sources to address these pressing issues.

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#### SETTING

A number of factors define New Mexico's border environment. Fundamentally, most of the state's border environmental resources including, its groundwater, clean air, and wildlife are shared by more than one nation or state. Under these conditions, mitigation of overuse or damage requires effective communication and coordination. The uniqueness and difficulty of devising multi-jurisdictional approaches for environmental planning and protection cannot be underestimated.

#### *Chihuahua Desert*

Geographically, the New Mexico-Chihuahua border lies at the northern end of the vast Chihuahua Desert that stretches deep into Mexico. The climate is a reflection of the desert extremes of warm, sunny days and cool, crisp nights. Humidity is low with the driest months being April and May. Most rainfall occurs during the late summer months.

Winter temperatures average 59 degrees Fahrenheit during the day and 27 degrees at night. Winter precipitation averages 1.57 inches. Spring temperatures average 76 degrees during the day and 41 degrees at night with 0.89 inches average precipitation. Summer temperatures rise to an average 94 degrees during the day and 62 degrees at night with 3.98 inches of rain. Autumn temperatures average 77 degrees during the day and 45 degrees at night with 2.53 inches of precipitation. All-time record temperatures are 112 degrees and 7 degrees. The average growing season in this portion of the U.S.-Mexico border is April 16 to October 31. Snowfall averages 3 inches.

Flora of the region reflects the desert environment. Mesquite and creosote bushes predominate in the lower plains; piñon, pine, and scrub oak are found at higher elevations. Cottonwoods are found in lower areas where the water table

rises close to the surface. Sage, rabbit brush, desert grasses, and cacti are prevalent throughout the desert plains.

Fauna is also representative of the high desert. Coyote, deer, and rabbits are found in large numbers. Significant populations of rare birds, including several varieties of hummingbirds, are observed on a seasonal basis.

### *Sky Islands*

The Sky Islands are located in southwestern New Mexico and northern Mexico. The region is ecologically unique because it is the crossroads of the temperate Rocky Mountains and tropical Sierra Madre Occidental, and is the meeting place of the Sonoran and Chihuahuan deserts. About 40 mountains of different sizes, rise within a sea of rolling grasslands and deserts. Hence, the name Sky Islands. Unique to the Sky Islands is a large number of rare birds that converge at this ecological crossing. Certain tropical birds, including colorful parrots, have been spotted in the region.

### *Rio Grande*

The Rio Grande watershed covers some 180,000 square miles (467,000 square kilometers), an area the size of California. The length of the Rio Grande is 1,885.41 miles (3033 kilometers), making it the 24<sup>th</sup> longest in the world. The river stretches across two countries (United States and Mexico), eight states (Colorado, New Mexico, Texas, Chihuahua, Coahuila, Nuevo León, Tamaulipas and Durango, and more than 20 Native American nations. The Conchos and Pecos rivers serve as tributaries to the Rio Grande.

### GENERAL OVERVIEW OF ECONOMICS IN THE REGION

The extreme poverty that defines the New Mexico-Chihuahua border region remains a significant factor in addressing border environmental issues. The 2000 U.S. Census finds New Mexico's border counties with 24.7% of its residents living below the poverty level and per capita income at 63.9% of the U.S. national average. Doña Ana, Luna, Hidalgo, and Otero counties are among the poorest in New Mexico, which as a state ranks among the poorest of the United States. In New Mexico there seems no bottom to border poverty. Ironically, in northern Chihuahua, as in other areas of Mexico's northern border, the opposition circumstance is apparent, with per capita income exceeding the Mexican national average.

Along the New Mexican border, public attention that would normally be directed to identifying and solving environmental problems competes with the more pressing human needs of food, shelter and medical care. Many rapidly growing communities in New Mexico have been designated *colonias*, unincorporated rural settlements with inadequate housing, roads, potable water, or wastewater services. Of New Mexico's 141 border colonias, 93% suffer from lack of adequate wastewater systems. It is feared that these conditions are becoming leading sources of groundwater contamination.

### *Santa Teresa and San Jerónimo*

In 1980, Santa Teresa was a small bedroom community of El Paso and a dream in the eyes of its developers, who wished to establish a well-planned commercial center on New Mexico's southern border. Today, Santa Teresa is a thriving port-of-entry boasting modern warehouses, customs brokerage services, and the attendant problems that come with commercial growth. Some 2,607 New Mexicans live in Santa Teresa and another 220 work in the approximate 65 import, manufacturing, and support operations that serve Santa Teresa and its well-groomed industrial park. In many respects, Santa Teresa is a success story, and the New Mexico Environment Department (NMED) has been instrumental in maintaining open communication with developers and providing assistance to businesses in reaching their environmental obligations. Even in Santa Teresa, though, some problems persist. Allocation of groundwater and expansion of an outmoded wastewater treatment facility remain to be resolved. Opposite Santa Teresa in the Mexican community of San Jerónimo, plans are in place for a modern commercial and residential development. As yet, no substantial development has occurred.

### WATER QUANTITY

The states of New Mexico and Chihuahua share vast underground aquifers supplying most of the water for drinking, cleaning, and other domestic uses. In addition, the two states use considerable groundwater for industry and agriculture. Surface waters in New Mexico's border region are confined largely to the mainstream of the Rio Grande and the Pecos rivers. These two rivers discharge to Texas and are then shared with Mexico. In northern Chihuahua, the Casas Grandes River, which once flowed seasonally, has been dry for several years.

The Mesilla Bolson aquifer, which extends from Caballo Reservoir in New Mexico into northern Chihuahua west of the Sierra de Juárez, constitutes the major source of groundwater for southern Doña Ana County, including Las Cruces, Sunland Park, Santa Teresa and other population centers. This aquifer, also called the Lower Rio Grande Basin (LRGB), covers some 300 square miles and supplies water to more than 54,000 acres of irrigated crop land. Approximately 8,000 acres are irrigated from surface water only (SEO 2000). Remaining acreage is irrigated with groundwater or a combination of groundwater and surface water. The municipal water utility of Juárez has developed plans to tap the Mesilla Bolson along the international border west of Juárez. This plan has been stymied by the high cost of pumping water over the Sierra de Juárez, a mountain range to the west and southwest of the city.

Groundwater from the Mimbres Bolson (Mimbres Basin) is the sole source of water for the Deming/Columbus/Palomas area. The Mimbres Basin covers an area of approximately 5,140 square miles, including 4,420 square miles in New Mexico. Within the Mimbres Basin, approximately 31,000 acres are irrigated with

groundwater in New Mexico and Chihuahua. Approximately 56,000 acre feet of groundwater were used for agriculture in 1997. It is estimated that 30 million acre feet of water is available in the Mimbres Basin.

Groundwater from the Hueco Bolson is a source of water for the Alamogordo area and the major water source for the cities of El Paso and Juárez. In 1999 approximately 191,000 acre feet of water was pumped from this aquifer with 63% being pumped by the city of Juárez. It is estimated that by 2030 usable water from this aquifer will be depleted (Little, 2000).

The New Mexico Interstate Stream Commission concluded in a water supply report for the Middle Rio Grande Basin (north of the LRGB between Cochiti and Elephant Butte reservoirs) that the present water supply in the Middle Rio Grande Basin is barely adequate to meet current demands. The use of groundwater resources from this basin results in diminished flows to the Rio Grande, which may affect the LRGB (WRRI, March 2000 and ISC, August 2000). This is a significant issue with interstate and international implications.

#### WATER QUALITY

Although data from Chihuahua is scarce regarding water contamination, NMED is aware of more than 100 documented cases of contamination in the state's three border counties. Since 1980, nitrate contamination of groundwater—generally due to agricultural operations and improper disposal of untreated domestic waste at individual homes, trailer parks, and small communities—has become the leading contaminant issue in the three border counties. Petroleum facilities are the source of 55 contaminated sites; pesticides have been found in groundwater at nine sites; solvent contamination has been identified at eight sites. Additionally, groundwater is contaminated at nearly 40% of permitted facilities in the border region.

On the New Mexico side of the border, there has been an influx of septic tanks, especially in Doña Ana County, where more than 1,000 septic tank permits are issued each year. Correspondingly, septic tank effluent has become a source of groundwater contamination in the border counties. However, Doña Ana County has developed a plan to extend the number and service area of publicly owned wastewater treatment facilities in outlying county areas. The county has demonstrated its success in pursuing this mission. In Mexico, rural households and businesses typically do not use septic tanks, but discharge into sewage canals or directly into the ground. Sometimes improper sewage disposal is a source of contamination for nearby water wells.

#### HAZARDOUS WASTE

Public attention in the border area is increasingly focused on matters of hazardous waste. There are a number of reasons for this. Since its inception in the 1960's, the border maquiladora industry has been evolving from an industry primarily of textile manufacturers to large-scale assembly operations that require

a greater use of raw materials, chemicals, and component parts. Large quantities of chemical solvents, for example, are routinely transported across the border in Ciudad Juárez for use in electronic parts assembly. Many of these materials and chemicals are hazardous or are associated manufacturing byproducts that are deemed hazardous. Some are highly toxic including certain acids, resins, paints, varnishes and heavy metals.

Confounding the issue are border industrial parks that have been built in densely populated locations or in close proximity to residential areas. Maquila products and byproducts are moved over existing transportation routes, a circumstance that poses risk to public traffic and residential areas. The public health and environmental problems that could result from accidental releases are complex and multimedia in nature and may include direct personal exposure to toxic chemicals, pollution of surface and groundwater, airborne contamination from volatilization, even exposure to radioactive materials.

There are additional hazardous waste issues of importance to New Mexico that merit attention. One purpose in opening New Mexico's Santa Teresa port-of-entry is for the eventual shift westward of commercial traffic between Mexico and the United States. While this shift in commercial traffic pattern has been slow to occur, plans for Santa Teresa include its eventual designation as the entry point for vehicles carrying hazardous wastes. At present, no hazardous wastes are allowed through the Santa Teresa crossing. But this is only due to a prohibition by the port director based on the absence of a capable and well-trained local emergency response team that must be on hand in the case of a hazardous emergency.

Other factors pose concern. There are indications that Mexico's requirement for the return to the United States of all hazardous materials and waste admitted for industrial production is not being followed uniformly. Illegal dumping of waste has been recorded in Ciudad Juárez and other Mexican border communities. New Mexico's border region, which suffers from limited surveillance and enforcement, is considered at risk for the illegal dumping of such waste. To address this concern, the State of New Mexico has contracted with private emergency response firms to respond to hazardous incidents, should they occur.

Underlying the hazardous waste issues is the tracking of chemicals and the disposal of hazardous waste in the border area. HAZTRAKS, an electronic database administered by EPA, was developed in 1992 to address this concern.

Although the United States and Mexico have laws and regulations for comprehensive management of hazardous wastes, Mexico's General Law of Ecological Equilibrium and Environmental Protection is relatively new. Mexico is still developing regulations and enforcement standards. Within the United States, hazardous waste is tracked by state manifest or Uniform Hazardous Waste Manifest and the Biennial Reporting System (BRS), which monitors the

generation of hazardous waste for Large Quantity Generators (LQGs) and permitted facilities. Through the BRS, waste generation rates are known for most of the large facilities operating on the U.S. side of the border. Without this information, U.S.-Mexican cooperative efforts to track hazardous wastes would be jeopardized. The likelihood of clandestine and illegal management and disposal of hazardous waste in New Mexico remains a concern.

#### SOLID WASTE

Solid waste in New Mexico's border area is managed by local government or private enterprise and it is regulated by the state. The border region encompasses landfills operated by the Otero-Lincoln Counties Solid Waste Authority; the South Central Solid Waste Authority (Las Cruces and Doña Ana County); Deming; Grant County Solid Waste Authority; and Waste Connections, Inc. (Doña Ana). A regional domestic landfill located south of Palomas lies in violation of Mexican federal and state regulations and has been implicated for its potential to pollute groundwater.

Proposed landfills include one from a private company, Rhino Environmental Services Inc., which has applied for a permit to construct and operate a landfill in southwestern Otero County. The City of Deming has applied for a permit to construct and operate a landfill near Cambray, approximately 25 miles east of Deming near Interstate 10. The projected disposal capacity for the border area counties is estimated to be adequate for the next 50 years for Otero County and more than 80 years for Doña Ana County with Waste Connections' Camino Real Landfill and the Corralitos landfills. The Camino Real Landfill, located in Sunland Park, receives the bulk of its waste from Texas and Mexico and has a life expectancy of more than 80 years.

Existing and planned border area landfills are expected to provide significant capacity for south central and southwestern New Mexico, and potentially El Paso and the Juárez area. The Otero-Lincoln, Corralitos and Southwest New Mexico Regional landfills currently receive significant amounts of imported waste. Rhino Environmental Services and the City of Deming have expressed interest in importing waste from other areas, so if new landfills are permitted and built at Chaparral (Rhino) or Cambray (Deming), they could offer disposal alternatives for border communities.

Currently, the only solid waste management facilities with the potential to accept significant quantities of recyclable materials in the border area are the Corralitos Recycling Facility, the Camino Real Environmental Center and the Grant County facility. While the Camino Real Facility was permitted by NMED for recycling, it has not yet opened due to unfavorable market conditions for recyclables. The Las Cruces Recycling Facility, also permitted by NMED, was established to process mostly residential and commercial recyclables. However, it may have the ability to process some imported recyclables. Grant County currently processes recyclables generated locally.

Other than the two proposed landfills previously mentioned, the siting of any new solid waste landfills or expansion of existing facilities in the near future is not anticipated.

Current solid waste landfill capacity has thus far been adequate to handle increases in the volume and types of solid waste generated in New Mexico's border area. While commercial and industrial waste generation in the border area affects existing landfill capacity and may sometimes pose special handling and disposal requirements, existing facilities appear to be handling the materials without adverse impact.

Limited public and private collection of recyclable materials is occurring in the Juárez-Doña Ana County area and in the Palomas-Columbus-Deming area. This may be the greatest opportunity for increasing solid waste capacity. Reportedly, large volumes of recyclable materials from maquiladoras are being disposed of in New Mexico landfills in the border region. Increased efforts to divert items for the waste stream for reuse and recycling could further increase economic activity in the border area as recycling is known to create six jobs to every one in landfill operations.

Continued economic integration with Mexico, the opening of border stations and the implementation of NAFTA have definitely affected solid waste activity in the border area. The resulting growth in population, commerce, and demand for disposal capacity may increase solid waste disposal costs, as well as the incidence of illegal dumping. The movement of solid wastes across state or international borders is not regulated by New Mexico. The requirement to return maquiladora wastes to the United States has already increased the potential for disposal of prohibited, regulated hazardous waste in New Mexico solid waste landfills.

The economics of transportation, coupled with the availability of inexpensive and geologically suitable land, is expected to increase pressure for disposal capacity in New Mexico by out-of-state concerns.

#### MINING

Settled more than 100 years ago as a mining community, the area around Silver City and Tyrone, New Mexico, today comprises the central mining district of the region. Copper is the chief resource and is extracted from the Chino mining facility in open pits large enough to be seen from the air. Several other regional mines have been shut down due to economic circumstances or dwindling production.

Curiously, a mining and smelter operation in the New Mexico community of Playas was abandoned and its entire real estate sold in a single transaction. Plans are in place for the ghost town of Playas to become the research facility for

New Mexico Technological Institute and its research in combating terrorism and aiding homeland security.

#### ENERGY

Electricity production and gas and electric relay stations can be found in the New Mexico-Chihuahua border region, specifically near the communities of Lordsburg, Deming and in Chihuahua to the southeast of Puerto Palomas. The facilities are licensed and approved by their respective governments. The Deming electric generating plant, owned by a Duke Energy affiliate, has not yet gone online.

Although deemed in compliance with state and federal environmental regulations, these plants and relay stations raise concerns about water usage. The 560-megawatt Duke Energy plant, for example, requires 4,000 acre-feet of groundwater annually for cooling. Recently, an East Coast firm has proposed to build a smaller electric generating plant east of Deming that would require 70 acre-feet of water annually.

#### TRANSPORTATION

Regional transportation routes for commercial hazardous waste disposal are marked and generally follow the route of two interstate systems that cross the region on the New Mexico side of the border: Interstates 10 and 25. In Chihuahua, two-lane highways south of Columbus and Santa Teresa route people and agricultural products between communities. Although Sunland Park suffers from air pollution generally attributed to its proximity to El Paso-Juárez; air pollution that is typically generated by large numbers of automobiles or commercial carriers is not a significant issue within the region.

#### AIR QUALITY

Air pollution along New Mexico's border with Mexico has long been a difficult issue to address despite repeated cooperative efforts by the United States and Mexico to characterize, quantify and control the problem. Since the advent of Mexico's maquiladora program both sides of the border have, until very recently, experienced rapid population and economic growth. One of the most severely impacted areas along the entire U.S.-Mexico border has been the Paso del Norte airshed of Ciudad Juárez, Chihuahua; El Paso County, Texas; and Doña Ana County, New Mexico.

Since the 1970s, El Paso has failed to meet the U.S. Environmental Protection Agency's National Ambient Air Quality Standards (NAAQS) for carbon monoxide, particulate matter, and ozone. Although the State of Texas and City of El Paso, with EPA's guidance, have applied measures to reduce emissions, monitoring data show ambient concentrations of these pollutants have continued to increase. Currently, Doña Ana County contains two small non-attainment areas that have failed to meet the NAAQS: Sunland Park for ozone (one-hour standard) and Anthony for particulate matter. Both non-attainment areas are composed of small, rural communities with low population densities and few emission sources.

Over the past 10 years, the United States and Mexico have taken a number of initiatives to address the air quality problems in this airshed cooperatively. Notable among these efforts has been Annex V of the 1983 La Paz Agreement, which provides for an assessment of air quality problems in the border area's sister cities; the development of the El Paso/Ciudad Juárez/Sunland Park sub-work group under the Integrated Border Environmental Plan; and the formation of the Paso del Norte Air Quality Task Force. The Paso del Norte Air Quality Task Force drafted a proposed Annex VI, but it was not approved by the U.S. State Department nor by its Mexican counterpart, the Secretariat de Relaciones Exteriores. Two main components of the proposed annex, however, were woven into Annex V through an appendix to the agreement known as Appendix 1. Appendix 1 now includes the formation of the Paso del Norte Air Quality Management Basin and the creation of the Joint Advisory Committee (JAC) on Air Quality Improvement for the Ciudad Juárez/El Paso/Doña Ana Air Quality Management Basin.

Monitoring data obtained from sites in Doña Ana County indicate that:

- Four exceedances of the ozone NAAQS have been measured from August 1995 to January 1998. Three of the exceedances occurred in 1995 and one in 1996. Ambient concentrations of ozone leveled off in 1997 and 1998, making Sunland Park eligible for attainment status.
- Ambient concentrations of particulate matter, 10 microns or less in aerometric diameter (PM<sub>10</sub>), have been measured at various monitoring sites in the county.
- There were no exceedances of the ozone NAAQS in 1999. One exceedance occurred in the third quarter of 2000 at the Santa Teresa Border Crossing on August 21, 2000. No exceedances of the ozone standard were measured during the first two quarters of 2001. Ambient concentrations of ozone reflect a stabilizing trend noted since 1997. A small area of southern Doña Ana County, which includes Sunland Park, is designated marginally non-attainment for ozone. NMED currently operates seven ozone monitoring sites in the county.

The NMED Air Quality Bureau (AQB) recently formed a study group to investigate high particulate, low-wind exceedances at the Sunland Park City Yard. Activities to date have included an analysis of meteorological and monitoring data in order to localize possible pollution sources. Group members participated in a tour of local brick kilns in Ciudad Juárez and the Anapra colonia along with representatives from Texas and Mexico. A continuous PM<sub>2.5</sub> monitor has been installed at the Sunland Park City Yard to compare PM fractions. Two camera sites are also under consideration to help identify the source of particulates during low-wind events.

Another continuous PM<sub>10</sub> monitor was installed on the West Mesa of Las Cruces in June 2000 to help quantify the desert contribution to PM<sub>10</sub> concentrations.

NMED now operates nine particulate monitoring sites in Doña Ana County with a combination of continuous and filter-based monitors

The AQB has developed a Natural Events Action Plan (NEAP) to address PM<sub>10</sub> air quality problems caused by high levels of wind blown dust. The NEAP for Doña Ana County was submitted to EPA in December of 2000 for review. This plan includes agreements between primary stakeholders including the New Mexico State Highway and Transportation Department, New Mexico State University and the State of New Mexico; dust ordinances at both the city and county levels; educational outreach tools; documentation of exceedances; and tools to minimize the public's exposure to PM<sub>10</sub>. Upon approval by the EPA, the plan will be reviewed and evaluated for effectiveness at least every five years. The reevaluation process should show what is and is not effective or feasible so that any necessary changes can be made.

The maquiladora program continues to lag in Mexican border communities with thousands of workers now unemployed. If the U.S. economy strengthens, however, border industrial development may be revived. New Mexico has two main border crossings at Santa Teresa and Columbus, which are expected to accommodate considerable private and commercial vehicular traffic. To date, ambient air monitoring at the Santa Teresa border crossing has only detected background concentrations of pollutants due to pollutant transport. Ambient air monitors are not set up at the Columbus border crossing.

The JAC was established for the purpose of developing and presenting recommendations to the Air Work Group established under the La Paz Agreement regarding strategies for the prevention and control of air pollution in the Paso del Norte Air Quality Management Basin. Partners include NMED, the Texas Commission on Environmental Quality (formerly the Texas Natural Resource Conservation Commission), Environmental Defense (formerly Environmental Defense Fund), and Mexico's Instituto Nacional de Ecología, and Procuraduría Federal de Protección al Ambiente. The JAC first met on November 12, 1996, and has continued to assemble quarterly.

The designation of non-attainment for Sunland Park now requires emission offsets greater than one-to-one for new major or modified industrial sources of volatile organic compounds and oxides of nitrogen under 20 NMAC 2.79, and reporting requirements for minor industrial sources under 20 NMAC 2.73. These regulations are designed to ensure that the ambient impact from industrial sources will not exceed New Mexico state ambient air quality standards or NAAQS.

#### ECOLOGICAL FOOTPRINT, LAND USE AND TRANSFORMATION/LAND COVER/GIS ANALYSIS

Generally, land use in the New Mexico-Chihuahua border region is much the same as it was 50 years ago. Little industrialization has taken place in this

section of the U.S.-Mexico border, although human populations have grown in number. There is some indication that ranching and farming have decreased in the Columbus area.

#### ENVIRONMENTAL HEALTH RISK

Environmental health issues vary depending on the community. These issues are a function of population density, geography, work force occupations, housing conditions, community infrastructure, etc.

Community concerns regarding environmental health were identified in a community-based environmental health assessment in July 2001. The assessment involved 171 key informant interviews with local community members from each of the six border counties. Based on the results of the interviews, water quality, air quality, water quantity, and sewage and sanitation were the four most frequently cited issue identified by the participants.

Many New Mexico border residents are not familiar with the connection between health and the environment. As a result, preventable illnesses occur because of personal behaviors that result in contamination of the environment or exposure to environmental agents.

The majority of the region relies on groundwater for its domestic water needs. Many of these sources contain arsenic at levels that will not meet the newly proposed EPA standards. Long-term exposure to arsenic is known to cause circulatory system problems, gastrointestinal irritations, and skin diseases such as cancer.

One well in the Las Cruces water supply system has been shut down due to contamination from perchloroethylene, a chemical commonly used in dry cleaning. Four other wells are being monitored. These wells are a part of the Walnut/Griggs EPA Superfund Site. The vulnerability of the water supply is an environmental health concern.

Based on a study of private wells in Doña Ana County, approximately 25% of the wells inspected were not constructed properly, lacking the appropriate sanitary seals and therefore at risk of becoming contaminated. Other issues included high levels of naturally occurring contaminants such as uranium, lead, and arsenic and the presence of volatile organic compounds. Private wells are not required to be tested under the Safe Drinking Water Act, a situation that may result in unintentional exposure to water contaminants. Although the study reflects only private wells in Doña Ana County, similar issues may occur throughout the region.

Although the majority of border residents currently receive their drinking water from groundwater resources, planning is underway to use the Rio Grande as a

future drinking water source. The use of the Rio Grande for drinking water will require alternative methods of treatment to ensure adequate protection.

Border area residents perceive air quality as an issue affecting their health. In a survey of 781 residents from the six border counties, 9% of the participants had a family member diagnosed with asthma and 37% associated dust with respiratory problems. One of the major contributors of airborne dust is from regional windstorms. These dust storms routinely cause exceedances of the EPA air quality standards for particulate matter (PM<sub>10</sub>).

The community of Sunland Park is experiencing repeated violations of the EPA air quality standard for PM<sub>10</sub> on low wind days. This indicates that human activity may be the cause. In addition, a high percentage of the PM<sub>10</sub> is comprised of material smaller than PM<sub>2.5</sub>, which can be more irritating to the respiratory system.

New Mexico's border region has a large agricultural presence and, as the area grows, there are fewer buffers between residential and educational areas and local farms, dairies, commercial, and industrial locations. Proximity to farmland is a concern because agro-chemicals used on crops can accidentally expose nearby residents and school children. A study of schools located near agricultural areas in Doña Ana and Luna counties identified 14 elementary schools with an enrollment of 7,626 students. Eighteen percent of the respondents indicated that they live within one to two blocks of agricultural land where crops are grown.

The agricultural industry in New Mexico's border counties employs a large number of farm workers to work on farms, dairies, and in processing plants. This industry poses a number of hazards that put workers at risk of exposure to pesticides and other agro-chemicals, as well as injuries and sun and heat exposure. Although there are laws in place to protect agricultural workers, there are limited resources to ensure that the laws are enforced.

Vector control is a concern in the border region. In a study of mosquitoes trapped in Doña Ana and El Paso counties several mosquito-borne viruses were detected (St. Louis Equine and Eastern Equine Encephalitis). These viruses are known to infect humans and in rare cases cause death. In addition, the West Nile Virus and several other vector-borne diseases may affect southern New Mexico.

In terms of food-borne illnesses the New Mexico border region has had 250 confirmed cases over the past two years. Food safety is a concern in the border region given the large number food establishments. In addition to the roughly 1,500 licensed facilities, a large number of community events/fiestas take place throughout the year. With limited food safety knowledge, food-borne illness will continue to be an issue in the region.

## ENVIRONMENTAL CHALLENGES AND SUCCESSES IN THE FUTURE

The U.S. Federal Safe Drinking Water Act establishes the standards for drinking water in New Mexico, including the state's border region with Mexico. These standards set limits for pesticides, volatile organics, radiochemical, chemical and bacteriological contaminants—all of which have been found in the region's groundwater. This makes it necessary to employ ever more complicated and costly treatment techniques to achieve drinking water standards. The major water quality problem faced by most ground and surface drinking water systems is *coliform* contamination found in the source waters and in the water systems that serve customers' homes. Although very little surface water is used in New Mexico's border region, diminishing groundwater resources dictate that surface water may be relied upon more heavily in the future. The protection of surface water sources for drinking water purposes, therefore, is critical.

As drinking water standards become increasingly difficult to achieve and naturally occurring groundwater meeting these standards becomes scarcer, the following issues increase in importance to assure sufficient water supply for drinking water needs in the border region:

- Development of adequate sampling and testing procedures to determine whether public water supplies meet federal/state drinking water standards
- Construction of well designed and constructed community systems employing safeguards to assure that water sources, storage, and distribution facilities are safe from contamination
- Creation of public entities in the border area to assure that whatever facilities are constructed continue to be operated, maintained, and managed appropriately
- Employment of water conservation measures to maximize the use of a limited resource
- Development of a state water plan to establish the relative importance of alternative demands competing for water and to assess the relationship between water quality and quantity

## DROUGHT

Now in its third documented year, the drought of the central border region is being recorded as extreme in sections of the border region. Elephant Butte Reservoir, the chief water source for 40% of El Paso's drinking water and the commercial agricultural areas of southern New Mexico, stands at 20-24% capacity. First line agricultural irrigation allocations have been reduced in southern New Mexico from 3 acre-feet of water per acre to 3 acre-inches. According to some estimates, the drought may be an actual norm. Tree ring data demonstrates that precipitation during the past 25 years has been abnormally high, rather than average. Meteorological forecasts identify no relief to drought conditions for the foreseeable future.

With drought conditions, communities in the New Mexico-Chihuahua border region face decisions on how best to conserve water and reduce consumption.

The city of Las Cruces, for example, has imposed restrictions on the use of outdoor watering for the first time in its history. Other communities, such as Columbus, which rely solely on groundwater have not felt an immediate impact.

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