

2. The Border Team at Work

Members of the binational multi-agency water working group called the Border Team include the U.S. Environmental Protection Agency (EPA) represented by its Office of Water, Mexico's Secretariat of the Environment Natural Resources and Fisheries (SEMARNAP) represented by its National Water Commission (CNA), International Boundary and Water Commission (IBWC), Border Environment Cooperation Commission (BECC), and the North American Development Bank (NADBank). EPA has and continues to participate with the other organizations to achieve the goal of improving surface water quality and protecting public health in the border area. Their authority and responsibilities fall within the scope of the following treaties.

2.1 La Paz Accord

In 1983 in La Paz, Baja California Sur, Mexico, the *Agreement between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area*, commonly referred to as the *La Paz Accord* was signed. It established a framework for cooperation between the U.S. and Mexico to prevent and eliminate sources of air, water, and land pollution along the border. Work activities under the La Paz Accord are coordinated by EPA and SEMARNAP. The 1983 La Paz Accord defined the 2100 mile (3200 km) stretch of borderland and established the border zone within 62 miles (100 km) on either side of the U.S.-Mexico border.

EPA was established in 1970 as an independent agency of the Executive Branch of the U.S. Government for protecting and regulating use of the nation's land, air and water resources. EPA Water Programs operate under the Clean Water Act (CWA) and the Safe Water Drinking Act. Under Title II of the CWA, Congress authorized the appropriation of funds to plan, design, and construct municipal wastewater treatment plants in the U.S. Over the last several years, EPA has received appropriations for construction of water and wastewater infrastructure along the border. Initially, this funding was focused on projects developed with the assistance of the IBWC.

The Water Quality Act of 1987 constitutes the most comprehensive amendments to the Clean Water Act since its enactment in 1972. Among their many provisions, the 1987 Amendments authorized the State Revolving Loan program, along with a phase out the Construction Grants Program, to increase the sharing of the construction costs by local communities. However, in these Amendments, Congress also included a specific authorization dealing directly with border environmental issues in San Diego, California and Tijuana, Mexico border area. EPA's Construction Grants Program and its successor, the Clean Water State Revolving Fund (CWSRF) Program, have provided \$67 billion in financial assistance to help communities improve local water quality, primarily by building or upgrading municipal wastewater treatment plants and sewer systems.

Section 510 of the Water Quality Act of 1987, as revised, provided EPA the authority for the construction of a 25 mgd secondary wastewater treatment facility in the amount of \$239.4 million to serve the cities of San Diego and Tijuana.

More recently, a large portion of the border infrastructure construction funds has been placed in the Border Environmental Infrastructure Fund (BEIF). The North American Development Bank (NADBank) acts as EPA's agent for disbursement of BEIF funds as grants for needs that cannot otherwise be fully met by a combination of NADBank loans or Mexican government grants, State and local government or private sector resources.

SEMARNAP was created in 1994 to organize Mexico's environmental policies, programs and fiscal resources into a single federal agency, whose functions are similar to their U.S. counterpart. SEMARNAP has the responsibility to protect, conserve, regulate, and promote environmental resources in cooperation with State and Municipal authorities, other Federal agencies, and individuals to implement state environmental policies in accordance to the National Environmental Policy. SEMARNAP manages the Mexican federal funding support for environmental infrastructure through grant-type subsidies.

EPA designated its Office of Water and SEMARNAP designated its National Water Commission (CNA) to lead their respective agencies on water matters.

In 1993, the U.S. and Mexico announced an interim target of \$700 million each in federal grants for planning, design, and construction of water and wastewater facilities over 7 to 10 years. The intent of this grant funding was to make projects affordable by using grants to augment debt capital.

2.2 NAFTA

Although primarily a trade agreement, the November 1993 North American Free Trade Agreement (NAFTA) was supplemented with specific environmental subagreements which provide border communities a greater role in determining and fulfilling their environmental protection needs. These provisions included the North American Agreement on Environment Cooperation (NAAEC), which is to be implemented by the Commission on Environment Cooperation (CEC), as well as the Border Environment Cooperation Commission and the North American Development Bank. CEC, BECC and NADBank are international organizations intended to implement certain environmental aspects of the agreement in communities on both sides of the border.

The BECC, located in Ciudad Juárez, Chihuahua, works with state and local governments to provide financial and technical assistance for development of projects dealing with water, wastewater, and municipal solid waste needs. BECC certification is required for a project to be eligible for financing from the NADBank, which arranges for public and private investment. Certification is based on a set of environmental, health, technical, financial, community participation and sustainable development criteria through a process that includes extensive public participation.

The NADBank, based in San Antonio, Texas, was created to serve as a financial partner and catalyst in financing construction of BECC- certified environmental infrastructure projects. NADBank's capital consists of \$3 billion, contributed equally by the U.S. and Mexican governments. NADBank functions as a financial broker, not only lending its own resources, but arranging loans

and grants from others. NADBank administers EPA's Border Environment Infrastructure Fund (BEIF) as part of its duties to supplement its loan and guaranty programs. BEIF funds are to be used as a funding source last resort to make projects viable and affordable for border communities. Currently, each dollar of EPA's BEIF funding has leveraged more than two dollars from other sources.

2.3 Other Border Relationships

The International Boundary and Water Commission (IBWC), consisting of U.S. and Mexican Sections, has expanded binational cooperation under the La Paz Accord, having executed a series of subagreements under their enabling treaties for projects to protect the environment and public health along the border through construction and/or upgrades of water and wastewater infrastructure.

The George E. Brown U.S.-Mexico Foundation for Science (FUMEC) coordinates, promotes, follows up, and evaluates actions aimed at the improvement of scientific and educational cooperation between Mexico and the United States, complementing the tasks of other public and private academic and research institutions in both countries. Currently FUMEC is implementing a Training, Certification and Technical Assistance Program (SCCAT) for the management of water and wastewater projects along the Border area with an EPA funding of \$3.5 million has been provided to FUMEC, of which \$2.0 million was used to establish an endowment and \$1.5 million for other purposes.

There are a total of ten border states which consist of four U.S. Border States (California, Arizona, New Mexico and Texas) and six Mexican States (Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas).

2.4 Major Data Sources

The surface water quality sampling data obtained for this report was provided by the U.S. Geological Survey (USGS), Texas Natural Resource Conservation Commission (TNRCC), International Boundary Water Commission (IBWC), New Mexico Environment Department (NMED), Arizona Department of Environmental Quality (ADEQ), City of San Diego, and the California Regional Water Quality Control Board (CRWQCB) San Diego Region.

The U.S.Center for Disease Control (CDC), Texas County Health Departments and the Pan American Health Organization (PAHO) provided the public health data cited in this report.

2.5 Public Health

The Center for Disease Control (CDC) maintains a database of waterborne disease occurrences that correlates the cause of waterborne disease with acute gastrointestinal illnesses. Agents which cause the highest incidence of infection are bacterial agents including *Shigella*, protozoan, including *Entamoeba histolytica*, and viruses including Hepatitis A. The selected waterborne diseases are reportable infectious illnesses with clear associations to contaminated water, primarily by fecal contamination.

2.5.1 Description of Illnesses

Amebiasis and Shigellosis both result in severe debilitating dysentery and prostration, whereas Hepatitis A symptoms are nausea, diarrhea, abdominal cramps, fever, and chills, and sometimes jaundice.

Entamoeba histolytica, the causative agent of amoebic dysentery or Amebiasis, is the only pathogenic amoeba found in the human intestine. *E. histolytica* is transmitted between humans through the ingestion of cysts. Some forms of amoebae can infect a person through skin contact with infected water, including swimming. These forms can also infect the blood, brain and spinal cord of a human. The more common severe dysentery can be recurrent.

Shigellosis is also known as bacillary dysentery, which produces an unusually virulent toxin. This illness is a clear indicator of lack of treatment facilities for human waste in the border region because the pathogenic bacilli reside only in the intestines of humans, apes, and monkeys. The *Shigella* bacteria proliferate to immense numbers in the small intestine, then they produce tissue destruction and scarring in the large intestine. The ulcerations in the intestinal mucus cause severe diarrhea with blood and mucus in the stools, and infected people can have as many as 20 bowel movements a day, resulting in dehydration. Health care (antibiotics and electrolyte replacement) is critical to avoid fatalities. Where good health care is not available, morbidity rates of those infected with the *Shigella* bacillus can approach 20 percent, with infants and young children especially vulnerable.

Hepatitis A has other modes of transmission in addition to water, which include transmission through contaminated food. Hepatitis A rates may decline through public health education programs that teach people sanitation before handling food. Therefore, declines in infectious disease rates may or may not be directly related to new wastewater treatment plants. However, these investments in public health education should, in time, directly improve public health. Hepatitis A typically enters the body orally, multiplies in the digestive tract, and spreads to the liver, kidneys, and spleen. The virus is found in the feces and is present in greatest numbers before symptoms are present. For this reason, a food handler responsible for spreading the Hepatitis A virus may not feel ill at the time. Additionally, the virus is capable of surviving outside the body for several days on surfaces such as cutting boards. Hepatitis A is resistant to chlorine at levels normally found in tap water used. Another common mode of transmission is in shellfish, especially raw shellfish.

The pathogen that causes Typhoid Fever is found only in the feces of human beings. The characteristics of high fever and constant headaches are followed by diarrhea. In severe cases, there can be perforation of the intestinal wall. The mortality rate in areas with good health care is only one to two percent, but left untreated, mortality can be as high as ten percent. Recovered patients can remain carriers and continue to transmit the infection indefinitely.

2.5.2 Remedial Progress

Even with the progress that has been and is being made, available public health data for the border area indicate high levels of Amebiasis, Shigellosis (amoebic dysentery), Hepatitis A, and other waterborne diseases that can be transmitted by use of, or contact with, untreated or poorly treated drinking water and wastewater. Disease rates are higher in the U.S. border area than in most other areas of the United States.

An outbreak of a disease on one side of the border threatens the other side because of migration of people across the border for a variety of reasons such as visiting family and friends, seeking employment, and/or conducting business on the other side. Therefore, there are some commonalities shown in the health data. Analysis of these data shows there is a demonstrated record of success in improving public health through the completion of wastewater infrastructure projects at the South Bay International Wastewater Treatment Plant (SBIWTP) as indicated on Figure 3-4 by a decrease in fecal coliform concentrations. Moreover, the waterborne disease rates for the San Diego County decreased with the exception of Typhoid Fever. There may be a relationship between the decrease of Amebiasis, Hepatitis A, and Typhoid Fever in the Nogales area and construction of the Nogales International Wastewater Treatment Plant. Generally the level of drinking water and wastewater treatment is less adequate as a general matter along the border compared with the rest of the U.S.

Table 2-1 indicates that the current incidence rates of disease are higher on the U.S.-Mexico border than the rest of the U.S.

Table 2-1. Comparison Between U.S.-Mexico Border And U.S.-Nationwide Waterborne Disease Rates (1998). (Incidences per 100,000 People)

Disease	US Border Rates	Mexican Border Rates	US Nationwide Rates
Amebiasis	1.4	798.8	1.4
Hepatitis A	37.1	50.1	12.6
Shigellosis	35.3	No Data Available	10.9
Typhoid Fever	0.4	36.1	0.2

Reference: Pan American Health Organization
website <http://www.fep.paho.org/healthprofiles>

