



# Border 2020: United States-Mexico Environmental Program

Key Closing Accomplishments  
Spring 2021



## Message from the National Coordinators

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The United States-Mexico border continues to face environmental and public health challenges for the growing population in this area. The **Border 2020 Program** was the most recent U.S.-Mexico environmental program completed under the 1983 La Paz Agreement, focusing on enhancing conditions for communities 62 miles on either side of the 2000-mile border. The Border 2020 Program collaboration over the past eight years has shaped the search for solutions to the environmental and public health challenges that characterize this dynamic region. Cooperation between the United States and Mexico goes back to 1992, when the formal programs began, showing the importance of collaboration toward achieving results.

Such an alliance has withstood time thanks to the invaluable support of our network formed by the federal governments, state and local partners, as well as the United States federally recognized Tribes along the border and indigenous peoples in Mexico. Through this binational effort, our shared environment and the communities of both sides of the border have benefited from the implementation of projects that address issues such as air quality, water quality, waste water treatment, solid waste management, emergency response and compliance assurance and environmental stewardship.

This report showcases the more representative examples and achievements of the Border 2020 Program in its last cycle of activities, through 35 projects that have been implemented and exemplify the progress of our work to improve the conditions of our shared environment for the benefit of border communities. It highlights the balance in the number of projects on both sides of the border, as well as the continuous improvement in management practices to achieve successful results in compliance with the objectives of the Border Program.

We express our deep appreciation to the dedicated individuals, communities and organizations that supported and participated in the implementation of activities in the border region. We recognize the importance and value of the commitment and contribution of our partners to the success of the Program.

Environmental cooperation between the United States and Mexico in the common border region is undoubtedly a success story and an example for the world, which we will continue to build upon in future collaboration.

Thank you!

## Foreword

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The Border 2020 Program's updates, publications, and public meeting information are available on the Program's website: <https://www.epa.gov/usmexicoborder>. Most recently, the program has shared seven bilingual newsletters through the program's listserv reaching over 7,000 subscribers with 12-26% open rates. Additionally, the Program developed and closed-out the 2019-2020 Action Plans. These Action Plans – created since 2013 - help track, assess, and provide a summary of known projects and efforts that are implemented in border communities. A number of actions from the 2019-2020 plans will be ongoing and added into the new 2021 plans developed for the Border 2025 Program to benefit communities of the U.S.-Mexico border region. For more information, please visit the general publications page for more on the bilingual newsletters and action plans: <https://www.epa.gov/usmexicoborder/borderwide-publications>

Due to ongoing pandemic (COVID-19), Program meetings transitioned to virtual sessions.

Various task force and regional work group meetings and binational outreach and special sessions with Tribal community representatives were conducted virtually for the development of the new Border 2025 Framework Document. Overall, these virtual sessions have reached over ~2,700 border stakeholders in the last 12-15 months and will continue to be a method of communication as we initiate the new border program.

- From the 2019 project selection, the Border Program has 13 ongoing projects with an estimate of \$820,506 in funding to meet open commitments made under the Border 2020 Program.
- Under the Border 2020 Program from 2013 to 2020, the U.S. EPA funded 113 projects, 63 in Mexico and 50 in the United States. These projects promoted solutions or monitoring related to air quality, used tire management, environmental health promotion, response to environmental emergencies and treatment of wastewater. These projects and other border efforts represent an investment of more than \$5.7 million dollars in border communities.

# Goal 1: Reduce Air Pollution

## Climate and Air Quality Network of Universidad Autónoma de Ciudad Juárez (UACJ) in Ciudad Juárez, Chihuahua



*Low cost sensor used at the Universidad Autónoma de Ciudad Juárez (UACJ) Station IIT-1.*

Universidad Autónoma de Ciudad Juárez (UACJ) developed a low-cost air sensor prototype with the hopes of expanding their air and meteorological monitoring network in Ciudad Juárez soon. These air sensors would help to provide real-time air quality information to the public within their community. The first phase of the project focused on building and programming software on three prototype sensors placed in the community, measuring ozone, PM, CO, temperature, and relative humidity. The second phase analyzed the hardware and software of the technology in order to operate a low-cost sensor long term, as well as, develop a webpage that visually demonstrated the station readings for all the prototypes. The last phase included archiving existing meteorological data from the nine stations UACJ operates and making this data publicly available.

## Reduction of Emissions through Collective Transportation Infrastructure in Ciudad Juárez, Chihuahua and El Paso, Texas



*Analysis of a proposal for better infrastructure and operations – Development of Executive Project.*

The Instituto Municipal de Investigación y Planeación (IMIP) of Ciudad Juárez, Chihuahua received a border grant to carry out a transportation and emission study at the three major Port of Entry (POEs): Paso del Norte, Bridge of the Americas (BOTA), Ysleta-Zaragoza, between El Paso, Texas – Ciudad Juárez, Chihuahua. The project used modeling to look at the potential for improvement of air quality if a dedicated lane for public transport vehicles was implemented at the International Port of Entry "Paso del Norte" between El Paso, Texas, and Ciudad Juárez, Chihuahua. The model concluded through implementation of a dedicated lane for public transportation, there is a potential of an 11% reduction in air pollutants in the region. Databases that include the characteristics of international mobility of users at the POEs, inventory of pollutant emission criterion generated by mobile sources and characteristics of installed infrastructure and road operation at port of entries in Paso del Norte Region were also developed.

## REDSPIRA - Expansion of an Air Quality Monitoring Network



*Air monitoring sensor*

The REDSPIRA network is a collaborative monitoring network in the Imperial/Mexicali air basin that provides public access to real-time air monitoring data from regulatory monitors and low-cost sensors in the region. To increase accessibility to border region communities, the real-time data mobile application, originally in Spanish, was translated to English. The project expanded this air network, adding 30 air sensors to measure PM<sub>2.5</sub>, and implemented data quality measures and a quality assurance plan. REDSPIRA also acquired 30 air quality flag packets to implement flag programs for schools in Mexicali Valley to share air quality information with the local community; 15 teachers were trained on the program. Increased access to air quality information allows residents in the Imperial and Mexicali communities, including vulnerable populations like individuals with

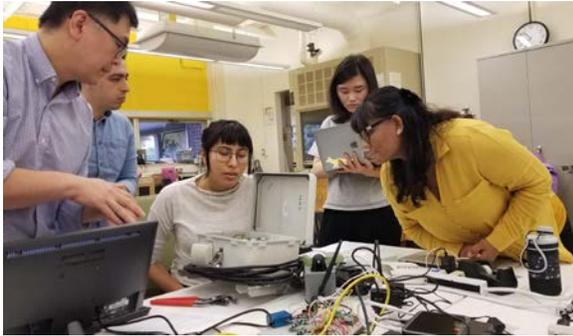
asthma, to protect their health by knowing the air quality conditions and when to avoid certain activities that increase risk of exposure or generate air pollutants. <https://www.redspira.org/>

## Cost-effective Diesel Engine



The Rio Grande International Study Center (RGISC) received a Border 2020 grant to reduce emissions from diesel engine idling in Laredo, Texas. The project, the Clean Truck Initiative, focused on outreach to owner-operator truck drivers who may not have the capacity to research and learn about new technologies that reduce emissions. The project distributed outreach educational material at Laredo Truck Stops, produced several public service announcements promoting the project, as well as, developed a bilingual “Money-Wise Trucking Guide” where commercial drivers and industries could find information on various idle-reduction technology that is currently available and economic savings and emission reductions from utilizing these technology. To view project material please visit: <https://rgisc.org/cleantrucking/>

## San Ysidro Port-Of -Entry Community Air Study



*SDSU MPH student Liliana Jaime and Casa Familiar technician Alejandro Amador set up the monitors*

The University of Washington, in collaboration with San Diego State University, the Universidad Autónoma de Baja California, and Casa Familiar, conducted a study of air quality in communities near the San Ysidro and Otay Mesa Ports of Entry (POE). The analysis focused on sources of particulate matter (PM) through the installation of six air quality monitors at the San Ysidro POE in Tijuana. The project found elevated levels of fine particulate matter (PM<sub>2.5</sub>) near the ports, compared to other sites in the Tijuana area. This project increased binational airshed knowledge, improved capacity for deploying lower-cost air quality monitoring technologies at multiple sites in the border region and provided continuous air quality data where routine government air quality monitoring data was not available. Complete findings are available on the university website: <https://deohs.washington.edu/san-ysidro-air-quality-and-border-traffic-study>.

## A Small-Scale Solar Implementation Project in Ambos Nogales



University of Arizona's objectives were to establish local and regional specific partnerships, create materials, workshops, and implementation protocols necessary for advancing solar energy in Ambos Nogales and along the Arizona-Sonora border area. Such efforts led to the establishment of an advisory board (forum) bringing together representatives of organizations with interest and experience in solar energy in Ambos Nogales; gathering data on existing and alternative solar installations on national and state level, and on local policies related to solar energy. Grantee also installed and gathered data on a pilot photovoltaic (PV) solar system, included materials and guide on small-scale solar energy at the site. During the project an educational website incorporated information about solar PV, real-time, and gathered information of the sensors and monitors located at the site of the PV system installation.

# Goal 2: Improve Access to Clean and Safe Water

## Mitigating Localized Flooding and Development of a Green Infrastructure Master Plan in Mercedes, Texas



*Before and after photos of high priority location, including engineer design of cross section of permeable pavement*

Due to expanding urbanization and increased rainfall, the landscape of the Lower Rio Grande is shifting from a natural environment to more impervious infrastructure. Urban stormwater runoff causes polluted water and a decline in aquatic biota. The University of Texas Rio Grande Valley, along with City of Mercedes and Lower Rio Grande Valley, proposed a Green Infrastructure Master Plan to mitigate localized flooding, stop contamination of water, and minimize environmental impact. The Plan calls for green infrastructure to be integrated into regional construction projects and as a tool for other cities. The project team conducted outreach on its Plan at various water conferences throughout the region. With the implementation of the Plan, the City of Mercedes expects an increase in green infrastructure projects in the city with the hope that it will enhance property values, increase quality of life and address flood issues.

## Safe Drinking Water for U.S.-Mexico Border Colonias in El Paso, Texas, and Ciudad Juárez, Chihuahua



*UTEP Student, Arahim Zuñiga, displays Bucket system*

Throughout the US-Mexico border region, several unincorporated areas known as Colonias, continue to exist while lacking basic water infrastructure. The University of Texas at El Paso evaluated the use of two low-cost Point-of-Use systems to create sustainable solutions for several unincorporated communities in the Paso del Norte Region. The two types of systems selected were the Sawyer Point one gravity driven bucket filter and the in-line Reverse Osmosis filter under the sink setup. A total of 14 under the sink Point of Use systems were installed in the US and 60 bucket filters were delivered to families in the Mexican Colonias. UTEP collected 84 water samples

and analyzed pH, conductivity, total dissolved solids, and other water properties to aid the filter installation project and analyze each filter's effectiveness in improving water quality. After the research was finished, the team conducted educational outreach to residents regarding environmental health issues related to drinking water in their community. Pre and Post surveys were utilized to assess water practices and perceptions of Colonia residents concerning water quality and behavioral changes. This project concluded that some residents were able stop purchasing bottled water for drinking because their water quality improved drastically. In addition, most of the resident's perception of use of these systems was positive and felt they were reliable systems to use for drinking water purposes.

## Transforming Urban Compacted Land into an Infiltration Field in Edinburg, Texas



UTRGV students conducting experiments as part of classroom hands on exercises on project site.

Communities along the US-Mexico border, rapid urbanization has led to an increase of stormwater runoff and urban flooding. The University of Texas Rio Grande Valley (UTRGV) studied the remediation of urban

compacted soils to improve infiltration by adopting agronomic practices (tillage and compost), to further look at how projects such as bioswales or rain gardens could be more effective. This project evaluated urban soil remediation consisting of tillage and/or compost through establishing field-testing sites, performing data analysis, and determining a turfgrass health indicator. The project concluded that whether applying both tillage and compost, or just doing one vs the other, promoted soil growth and/or increased infiltration rate. The project team presented their results at various conferences in the region. In addition, the project served as an outdoor classroom for UTRGV students in environmental science, geology and soil science courses.

## Wastewater Discharge Regulation in Matamoros, Tamaulipas



Informational pamphlet distributed at training workshops and educational conferences.

In Matamoros, Tamaulipas, Fats, Oil and Greases (FOG's) from business and commercial entities has led to sewage accumulation and collapsed sewer lines

within the existing wastewater infrastructure. The Border 2020 project provided training workshops and outreach to FOG generators to promote awareness of wastewater infrastructure and ecosystem protection. The primary workshops focused on reinforcing pretreatment and control programs of FOG disposal through the installation of grease traps that reduce sewer system blockages and line failures. Matamoros then launched an electronic media campaign to educate residents about the importance of disposing FOG in sustainable ways instead of down the drain. As part of the outreach, 15 grease traps were distributed to businesses in trainings and workshops held. In addition, compliance inspections and wastewater discharge sampling analysis of was conducted at various commercial entities.

### **Strategies for Reducing and Preventing Disasters in Ciudad Acuña, Coahuila and Del Rio, Texas**



*Public Education Workshop on GI. Participants developed a small GI project.*

The Universidad Carolina received Border 2020 Program funding to work with the municipality of Ciudad Acuña, Coahuila to develop a comprehensive Green

Infrastructure (GI) Masterplan to help reduce flooding within the urban area. The project team also produced a GI Guide for border communities in the Chihuahua Desert as well as a Train-the-Trainer Manual for outreach. As part of the project, a total of 46 participants (6 staff members from the Municipality of Ciudad Acuña, 15 community leaders throughout the city and 25 university students), were trained in three train-the-trainer workshops. These 46 newly trained facilitators then conducted an additional six educational public workshops and six train-the-trainer workshops in the fall and spring of 2018-2019, which were attended by 120 persons.

### **Rainwater Harvesting**



*Rainwater harvest system at mobile home in Cochran Colonia, El Paso County, Texas.*

Along the US-Mexico Border, approximately 2,300 colonias exist in the state of Texas. Colonias, or unincorporated communities, are substandard housing developments that

lack basic services such as drinking water, sewage treatment, and paved roads, which can lead to several public health issues for residents. Residents often must purchase and haul water to their residence for both indoor and outdoor uses. The University of Texas at El Paso (UTEP) – Center for Environmental Resource Management (CERM) received a Border 2020 Program grant design and construct three rainwater harvesting systems for colonias in El Paso County. These systems would help provide a means of reducing the amount of water residents need to haul for landscaping, outdoor gardening and/or their animals. UTEP developed a how-to manual and video available at: <https://rainwaterharvestingdemo.weebly.com/>

### Source Characterization in Nogales, Sonora



*Taking water samples for heavy metals*

In 2018, Water Utility (OOMAPAS) and the International Boundary and Water Commission (IBWC) sampled for heavy metals (copper, chrome, zinc, nickel) impacting the Santa Cruz River and Nogales Wash in the binational Santa Cruz

Watershed. 102 samples were taken from six sites in Nogales, SN and processed at laboratories in Phoenix, AZ and Pima County, AZ. The monitoring identified industrial parks whose discharges correlated with specific metal loadings detected downstream. OOMPAS continues to expand on this effort and a future consideration is to provide additional laboratory support for OOMAPAS to increase monitoring of candidate facilities.

### Urban Bioretention for the Protection of Streams



*Public Education Workshop*

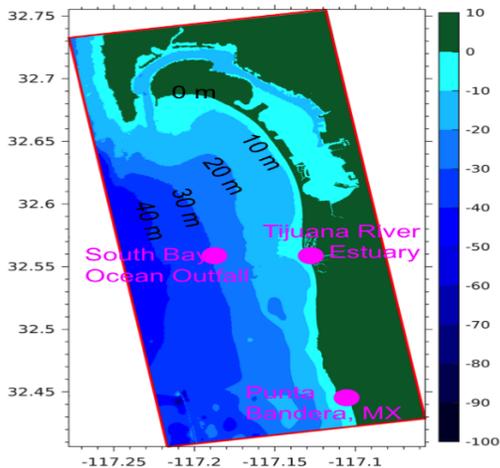
Municipal Planning Institute of Nogales (IMIP) and the Watershed Management

Group, a non-profit, worked together on green infrastructure (GI) pilot projects to improve water quality that runs through Cañada El Muerto in Nogales, SN. The team installed biofilters using large rocks (gabion) that captures 650 cubic meters of sediment to decrease sediment loading, which can break collection pipes and sewer lines. A demonstration planter, within its first three months captured about 37,000 liters of rainwater. Volunteers removed 10 tons of garbage from streams and implemented 6 trainings and awareness courses to 321 workshop attendees.

along the Pacific coastline between Punta Bandera in BC, and Imperial Beach, CA. Scripps developed a modeling effort to study and assess the impact, leading to a better-informed public, an assessment response to future spills, and measures to preserve water quality in the California-Baja California Border region. The project led to a "phase II" effort sponsored by EPA's Project Development Assistance Program (PDAP).

## Border Environment Infrastructure Fund (BEIF) - Projects

### Evaluating the 2017 Cross-border Wastewater Spill Sources and Impacts



*San Diego South Bay – Tijuana coastline highlighting key point sources (pink) and focused on the highest resolution numerical model grid domain (LV4). Bathymetry is shown in color.*

### South-South Collector in Valle de Juarez Wastewater Treatment Plant in Ciudad Juárez, Chihuahua

In September 2018, construction was completed on the last segment of the 10.3-kilometer South-South Collector that will transport wastewater from subdivisions located southeast of Ciudad Juarez to the new Valle de Juárez Wastewater Treatment Plant (formerly known as the South-South plant), which was also constructed as part of the certified project. The collector varies in size, beginning in the Riberas del Bravo subdivision with a 60-inch diameter and ending with a 90-inch diameter at the treatment plant. It was designed for average flows of between 34 million and 114 million gallons a day (mgd) to account for storm water flows from the city's combined system, as well as to allow additional subdivisions in the region to connect to the plant in the future.

This Scripps Institution of Oceanography implemented a transnational assessment on spill impacts, specifically one spill that took place in February of 2017,

The plant has the capacity to treat up to 11.4-mgd through an activated sludge process. Approximately 1.1 mgd of wastewater were being conveyed to the plant to start its stabilization process. This flow increased to about 9.1 mgd through November, and the stabilization process was likely concluded by December 2018. The treated water may be reused for a broad range of urban and agricultural applications. The US\$42.3-million project was partially funded by a US\$9.4 million NADB loan and an US\$8.0 million BEIF grant, as well as grants from the Mexican government and equity contributions from the private company awarded the contract to build and operate the plant.

### **West Wastewater Treatment Plant in Matamoros, Tamaulipas**



In September 2018, the West Wastewater Treatment Plant began operation with the capacity to treat up to 12.3 million gallon a day (mgd) or 540 lps through a lagoon-based treatment process. The US\$69.7-million project also included construction or rehabilitation of eight lift stations, gravity collectors and force mains, to convey

wastewater to the new treatment plant, as well as the installation of sewer systems in 32 subdivisions in the southwestern area of the city. Prior to the project, wastewater treatment was only available downtown and on the east side of the city through a lagoon-based plant with the capacity to treat 11 mgd. Consequently, most of the wastewater collected was being discharged untreated into the Rio Grande or open-air drainage channels that eventually empty into the Gulf of Mexico. As the plant completed the stabilization process, the utility gradually increased flows from the current rate of 4.7 mgd to about 9.5 mgd from the new sewer systems, increasing treatment coverage to 80% of the wastewater collected. These wastewater works were partially funded by a US\$12.78-million loan and a US\$15.52 million BEIF grant, as well as federal and state grants. The utility continues to implement several components of the certified project, including construction of wastewater systems in two additional subdivisions. Now that the remaining collection and conveyance infrastructure has been completed, the project provides first-time access to wastewater treatment to nearly 44,000 households, benefitting an estimated 160,880 residents.

### **Wastewater Collection and Treatment Services in San Luis Río Colorado, Sonora**

Expansion of the sewer system along side streets or alleyways known as “B” avenues in eight sectors of the city was completed in March 2018, providing first-time wastewater collection and treatment services to an estimated 14,023 residents. The project

included the installation of approximately 243,280 feet of sewer lines and 3,790 residential sewer hookups in the Guadalupe Victoria, Chihuahua, Calle 13, Calle 18, Ejido Oriente, Ejido Poniente, Jazmin and Las Flores sectors on the south and east sides of the city, which are expected to collect an estimated 920,000 gallons a day of wastewater. Prior to the project, residents used latrines or cesspools to dispose of their wastewater, which were a potential source of groundwater contamination. As part of the project, all the on-site disposal systems were closed in compliance with applicable regulations. This project is the fourth certified and funded by the Bank as part of a comprehensive wastewater infrastructure improvement plan initiated by the local water utility in 2000. With this project, wastewater collection coverage has increased from 80% in 2014 to 84% of the population.

### **Tijuana River Diversion Rehabilitation Project**



Rehabilitation of the wastewater collection systems in the Buena Vista and Lomas de Agua Caliente subdivisions as well as

rehabilitated sections of the Sanchez Taboada and Industrial Collectors, among other works were completed in October 2018. Altogether, 28,967 linear feet (5.5 miles) of deteriorated sewer mains and lines were replaced in the downtown area of the city, reducing the risk of line breaks and sewage spills in the streets and preventing the potential contamination of binational water bodies, such as the Tijuana River. In addition, 468 homes were connected to the wastewater collection system infrastructure previously built within the Tijuana River Basin. The new connections are collecting an estimated 80,340 gallons a day of wastewater in the Maclovio Rojas, Ojo de Agua and Lomas del Valle subdivisions, which were previously disposed of in latrines or cesspools and are now being properly treated at the La Morita Wastewater Treatment Plant. Approximately 523,000 residents are directly benefitting from improved wastewater services in the project area, while an estimated 1,940 residents are enjoying first-time service.

### **New Sewer System in Socorro, Texas**



In April 2018, construction was completed on a new gravity sewer system to provide first-time service to 233 residents of Cotton Valley, a subdivision in the city of Socorro,

located approximately 20 miles southeast of El Paso, Texas. Residents in Cotton Valley receive water service from the Lower Valley Water District (LVWD) but, prior to the project, relied on septic tanks for wastewater disposal, which were failing, causing sewage overflows and unpleasant odors in the neighborhood, as well as posing a human health risk. The project consisted of installing 5,520 feet of sewer lines and 63 residential sewer connections, as well as decommissioning an equal number of septic tanks. The new sewer system is connected to the existing LVWD wastewater collection infrastructure along North Loop Road, which conveys the collected flows to Robert Bustamante Wastewater Treatment Plant in El Paso. An estimated 23,300 gallons a day of sewage will be collected and treated.

### **Wastewater Collection System in Brownsville, Texas**



Colonias are low-income, substandard housing developments along the US-Mexico border region that lack basic infrastructure such as drinking water, sewage treatment, electricity and paved roads. In October 2018, work was completed on construction of a wastewater collection system for the FM 511-802 colonias, with the installation of the last of the residential sewer connections funded with a BEIF grant. Prior to the project, residents in the area relied on open cesspools or substandard septic tanks that were failing due to design flaws or lack of proper maintenance. In addition to connecting 572 homes to the new system and decommissioning 474 septic tanks and/or cesspools, the project entailed the construction of seven new lift stations and rehabilitation of three existing lift stations, as well as the installation of approximately 25.6 miles of sewer lines funded by the Texas Water Development Board (TWDB) and the Brownsville Public Utility Board (BPUB). The wastewater system is providing first-time service to approximately 2,200 residents and is collecting an estimated 175,720 gallons a day of sewage that is being conveyed to the South Wastewater Treatment Plant.

## **Camino Real Regional Authority Wastewater Treatment Project in Sunland Park and Santa Teresa, New Mexico**



In March 2019, construction was completed on a new wastewater treatment plant with extended aeration technology and the capacity to treat 1.0 million gallons a day (mgd), which will serve an estimated 6,400 residents in two communities located a few miles northwest of El Paso, Texas. The new facility replaces a smaller lagoon-based plant built in the 1970s, which was severely overloaded—not only hydraulically but also organically as a result of industrial discharges to the sewer system—and thus was unable to meet its discharge requirements. Consequently, wastewater flows had to be diverted to another facility, reducing overall system capacity and limiting the installation

of additional connections. The new US\$12.7 million (US\$9.0 million in BEIF grant) plant is expected to treat average wastewater flows of 0.70 mgd, which will be discharged to the Rio Grande River. The project also included rehabilitation of the View Pointe Lift Station, which pumps wastewater from the collection system to the new treatment plant, as well as incorporated elements for phased expansion of the treatment plant to meet future demand generated by urban development in the region. In addition, the Camino Real Regional Utility Authority (CRRUA), which owns and operates the plant, adopted a pretreatment ordinance requiring industrial users to pretreat their wastewater prior to discharge to the sewer system in order to prevent issues with organic loading in the future.

## **North Alamo Regional Wastewater Collection and Treatment Project in Hidalgo County, Texas**



In June 2019, work was completed on a project to expand the wastewater collection and treatment system of the North Alamo

Water Supply Corporation (NAWSC) in order to provide first-time service to six colonias located northwest of the city of Donna. Prior to the project, most residents relied on septic tanks or open cesspools; however, due to inadequate construction, population density, small lot sizes, high water tables and poor storm water drainage, the majority of those systems were generally not considered to be in compliance with regulatory requirements and posed a health hazard, especially during wet weather. A total of 400 residential wastewater connections were installed in Alberta Acres, El Charro # 2, Isaac's Subdivision, L. J. #1, Muniz Subdivision and Tower Road Estates, and the on-site wastewater disposal systems were also decommissioned. The project included the construction of five lift stations, as well as a regional wastewater treatment plant with Carrousel® oxidation ditch technology and the capacity to treat 0.50 million gallon a day (mgd), which was completed in May 2018 with state funds. As a result of this project, an estimated 0.17 mgd is now being collected and treated, directly benefitting more than 1,600 residents.



## Rehabilitation of the Collector Poniente in Tijuana, Baja California



In June 2019, work was completed on the rehabilitation of three segments of the Poniente Collector. This sewer main runs parallel to the Tijuana River for about 10 miles and conveys an average of about 4 million gallons a day of wastewater in the project area. In 2017, two major breaks in the pipeline resulted in discharges to the river, a transboundary waterbody that empties into the Pacific Ocean. Through this project, a total of 14,870 feet (2.82 miles) of deteriorated pipeline was replaced, along with 1,922 ft of sewer laterals connected to the collector, minimizing the risk of breaks and ensuring that wastewater flows are safely conveyed to the treatment plant. The rehabilitated collector is directly benefitting an estimated 86,950 residents living in the project area by preventing possible sewage spills on the streets in their neighborhoods. Even more importantly, the project is helping protect the Tijuana River from future spills, thus benefitting the people living

downstream along both sides of the border and along the Pacific coastline.

### **Wastewater Treatment Plant Improvements in Willcox, Arizona**



*Newly constructed oxidation ditches at the Willcox WWTP*

In December 2019, construction of the new wastewater treatment plant was completed. The project consisted of rehabilitating and modernizing the plant by changing the treatment process from a lagoon system to an oxidation ditch process, as well as installing secondary clarifiers, tertiary filtration and a disinfection system. With these improvements the plant has the capacity to treat up to 600,000 gallons per day of wastewater in compliance with its discharge permits and all applicable regulations. The improved quality of the treated water prevents further contamination of Lake Cochise as well as protect the local aquifer. Likewise, the City can continue reusing the treated water to irrigate the golf course, thereby conserving potable water resources in this small community of 3,757 residents,

located in the arid Sonoran Desert east of Tucson, Arizona. With the new treatment plant in operation, the City is working to complete the closure of the abandoned lagoon system, which entails a lengthy drying process.

### **Wastewater Infrastructure Project in Marathon, Texas**

Work to replace a portion of the sewer main that conveys wastewater to the treatment plant was completed in June 2020, benefitting 540 residents of this small community located in Brewster County in the Big Bend region of Texas. The local utility was experiencing chronic issues with line breaks and sewage spills due to the age and deterioration of lines constructed nearly 50 years ago using 6- and 8-inch vitrified clay pipes. In some cases, raw sewage had backed up into homes and businesses exposing the public to serious health risks. In addition to replacing approximately 8,800 feet of the sewer main from the First Street alley to the treatment plant, the pipeline was realigned to allow the only lift station to be decommissioned, which will greatly reduce operation and maintenance expenses for the utility. This realignment also made it possible to extend the collection infrastructure to nine homes in Fussy Flats and Loma del Chivo, the only areas within the town that did not have access to the system. As a result, 100% of the wastewater generated in Marathon is being collected and treated.

## **Lift Station Replacement Project in Anthony, New Mexico**



The new Sonic Lift Station completed testing in June 2020 and is now in operation, conveying an average of 400,000 gallons a day (gpd) of wastewater to the treatment plant. The old station built in the 1980s had reached the end of its useful life and was experiencing frequent pump failures that was causing wastewater to back up into neighboring homes and businesses. The project consisted of replacing and expanding the lift station, as well as installing a 21-inch gravity line to reroute wastewater from the existing station to the new station and a 12-inch force main to connect the new station to the treatment plant. The new consolidated lift station is located on the north side of town, away from existing residential and commercial development, and has an average flow capacity of 900,000 gpd, more than double the capacity of the old station. As a result, it will allow six other lift stations to be abandoned in the future, which will reduce energy consumption, as well as operation and maintenance costs for the Anthony Water and Sanitation District (AWSD). Eventually, the new station will convey nearly 90% of the

wastewater generated in this small town of 8,700 residents to the treatment plant.

## **Wastewater Collection Project in Loma Blanca, Chihuahua**

In June 2020, construction of the remaining sewer system infrastructure and the installation of residential sewer connections was completed, thus completing the entire certified project. The new system is providing first-time wastewater collection treatment services to 100% of this small community located approximately three miles southeast of Ciudad Juarez, CHIH. Prior to the project, residents used latrines and substandard on-site sanitary systems for wastewater disposal, and occasionally wastewater was discharged directly onto streets or vacant lots. The project consisted of building a gravity wastewater collection system that discharges into the South-South collector main, which flows to the Valle de Juarez Wastewater Treatment Plant. A total of 28 miles of sewer lines were installed, and 993 homes were connected to the new system, benefitting an estimated 4,990 residents. All existing on-site wastewater disposal systems were also decommissioned. The new system is collecting an estimated 205,420 gallons per day of wastewater.

# Goal 3: Promote Materials Management and Waste Management and Clean Sites

## Waste Separation Stations in Matamoros, Tamaulipas



*Matamoros staff conducting outreach at a school.*

The municipality of Matamoros, Tamaulipas received funding from the Border 2020 Program to implement an integrated solid waste management pilot program. The pilot project included public outreach and education, as well as, six recycling stations placed throughout the city for plastic, paper/carton, metal and 50 battery recycling stations at the OXXO auto service stations. The municipality staff provided outreach at schools and workshops at local parks, reaching more than 3,000 children and 400 additional community members. In these events, the city provided information on recycling but taught the community how to compost and highlight the impact to public health of burning their trash. Between April 2019 and February 2020, the city was able to collect and divert the following recyclables from going to the landfill: 15 tons of carton, 13.2 tons of aluminum, 17.6 tons of plastic and 3 tons of batteries.

## Reduction of Pollution Generated by Disposable Plastic Bags



The Southwest Wetlands Interpretive Association (SWIA) project developed “Embolsate”, an educational campaign on the role of single-use plastic bags contributing to marine litter and community-based actions to solutions to address the problem. SWIA collaborated with local students and convenience stores to educate customers and offer them reusable bags at the convenience stores, instead of taking a single-use plastic bag. The action aims to reduce trans-boundary, land-based sources of plastic flowing into the Tijuana River Estuary. SWIA launched a city-wide educational campaign to raise awareness of plastic contributing to marine litter and change behavior to eliminate use of single-use plastic bags in Tijuana convenience stores. The campaign achieved international recognition through 59 press and social-media outlets and 12 radio-television events. They advised and supported businesses and government to reduce single-use plastic bags, trained 230 student volunteers, and distributed 11,630 reusable bags. Lastly, the project focused on

collaboration with border cities and states to draft legislations to reduce single-use plastic bags.

## Collection Network



Fundación Hélice, a non-profit, installed a network of collection sites in the city of Mexicali, Baja California to facilitate the collection of household discarded electronics and other recyclable materials and support to separate and transport the collected materials to recyclers. Project efforts included the installation of five material collection containers and the collection of 19 tons of materials for recycling, avoiding illegal dumping. Through outreach the community also learned about public health risks and environmental impacts associated with dumping and learned about best practices to manage discard electronics and other materials.



## Illegal Dumping Cleanup Program to reduce trash in Ambos Nogales

Municipality of Nogales, Sonora developed a phone-based application for citizens to report clandestine trash dumps. Information was used to inventory sites and assess if they were privately or government land, including on public roads where trash is found. The project engaged the public to report trash sites using WhatsApp notification and used this information to map sites and complete cleanups at 33 sites, preventing transboundary trash flow. Municipality staff also used notifications to verify and map dumping locations to inform enforcement actions to prevent future dumping. The project also assessed small to large business trash management needs and provided new services and oversight to prevent future trash dumping. Due to the pandemic, presentations on project efforts have been presented virtually at several Task Force meetings in the Arizona/Sonora region.

# Goal 4: Enhance Joint Preparedness for Environmental Response

## Building Joint Advanced Emergency Response Capacity through Enhanced Tabletop Exercise; Arizona-Sonora Border



Arizona State University (ASU) partnered with the Instituto Tecnológico de Nogales Hazmat Institute (ITN) to create a first-time binational Table-Top Exercise (TTX) materials and trainings in Spanish coordinated with Arizona Department of Environmental Quality, state and local emergency response agencies, as well as maquiladora associations. Project built capacity and enhanced cross-constituent engagement through emergency simulation training with industry representatives, first responders, and local emergency management departments. Grantee procured six tablets for in-class demonstrations of hazardous materials plume modeling applications CAMEO and WISER; enhanced a two-day TTX course in Spanish for ITN staff including faculty who took train-the-trainer classes on table-top exercises; and developed three After Action Reports/Improvement Plans. The TTX courses trained 142 people in Sonora were hosted by key companies such as MTD (Nogales), Levolor (Agua Prieta) and Flex (San Luis Rio Colorado).



# Fundamental Strategy: Advocating Environmental Health

## Collaborative K12 Capacity Building and Research for Air Quality Monitoring



*Workshop attendee learning to use the GPS unit and using the app Survey123 for ArcGIS installed on a smartphone for real-time data collection.*

The University of Texas at El Paso collaborated with the school districts in Southern New Mexico and West Texas to promote education in Geographic Information Systems (GIS) to help students understand real-world local, regional, or global issues and build their critical thinking skills to investigate these problems. The project focused on training teachers to educate students on inquiry-based learning of environmental issues of air, water quantity and quality, urban growth, and environment-human health interactions. Over 90 educators were trained through four 2-day workshops on using the ArcGIS platform. The workshops included hands on exercises and interactive material to supplement teacher's technical skills with GIS. The project was successful in enhancing environmental awareness of K-12 educators by using GIS in the El Paso Region.

## Children's Health Webinar



A key achievement in 2020 involved USEPA, Border 2020, NADB, and Western States Pediatric Environmental Health Specialty Unit collaborated on a virtual bilingual webinar with 240 viewers called “Ask the Experts: Wildfire Smoke, Mental Health and Green Cleaning-Sanitizing-Disinfecting.” Beyond the bilingual webinar, there were a series of public services

announcements on air quality (Air Quality Index or AQI and how to access air quality information), wildfire smoke, and children's health reaching over 700 viewers ([Ask-experts](#)). During the session, the experts answered live questions on wildfire smoke; mental health; and green cleaning, sanitizing, and disinfecting during the COVID-19 pandemic.

## Mission Statement:

*As a result of the partnership among federal, state, local governments and tribes along the border in the United States and Mexico, the mission of the Border 2020 Program is to:*

Protect the environment and public health in the U.S.-Mexico border region, consistent with the principles of sustainable development.

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