

Border 2025

MEDIO

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United States-Mexico Environmental Program

> **Highlights Report Summer 2024**



A program of U.S. EPA and Mexico's SEMARNA

Table of Contents

National Coordinators' Message		
Foreword5		
GOAL 1: Reduce Air Pollution7		
Air Quality, Transportation, and Environmental Justice Analysis in Mexicali		
Impact of Nava, Coahuila Coal-fired Plant Emissions8		
Strengthening Mexican Emissions Inventories in Baja California and Chihuahua		
Air Sensors Training10		
Binational Collaboration: Key to Improve Air Quality in the Paso del Norte Region		
Inauguration of the new Air Quality Monitoring Site of the Juárez Network		
85TH Meeting of the Joint Advisory Committee (JAC)12		
Two-day Workshop on Quality Assurance and Quality Control (QA/QC) for Air Quality Data		
Current Ongoing Air Quality Projects in Border Communities:14		
GOAL 2: Improve Water Quality17		
Pre-treatment of Wastewater with Heavy Metals and Reuse in Nogales		
Binational Trainings for Sediment Pollution Retention in Sonora and Arizona		
Developing Wastewater Reuse Design on Cocopah Tribal Lands21		
Goodenough Spring Catchment Area Characterization, Amistad Reservoir, Rio Grande Valley		
Binational Agreements to reduce Transboundary Water Pollution in San Diego and Tijuana		
Current Ongoing Water Quality Projects in Border Communities:		
Border Environment Infrastructure Fund (BEIF) PROJECTS		
Rehabilitation of the Collector Oriente in Tijuana, Baja California		
Improvements to the International Outfall Interceptor: Relocation of Lateral Connections and Erosion Protection in Nogales, Arizona		
Southwest Colonias Lift Station Improvements in Nogales, Sonora		
Wastewater Collection System (Phase I) and Lift Station Improvements in Mexicali, Baja California		
Rehabilitation of Small Lift Stations in Mexicali, Baja California		
Water System Improvements Project in Presidio, Texas		
Wastewater Collection and Treatment Project in Camargo, Tamaulipas		
Wastewater Collection and Treatment Project in Reynosa, Tamaulipas		
Rehabilitation of the Collector Poniente: Segment 1A in Tijuana, Baja California		
Bay Acres Wastewater Collection System and Wastewater Treatment Plant Expansion in Douglas, Arizona 34		
Groundbreaking Ceremony of Phase II New Drinking Water and Wastewater System in Vinton, Texas		

GOAL 3: Promote Sustainable Materials Management and Waste Management, and Clean Sites		36
	Waste Policy Workgroup 2022 and 2023 Binational Meetings	36
	Consultative Mechanism	36
	Webinar: Challenges and Best Practices in Sustainable Electronic Waste Recycling	37
	California-Baja California Waste and Materials Management Workshop	37
	Arizona-Sonora Goal 3 Task Force Meetings	37
	Webinar: Sustainable Management of Food on the U.SMexico Border	38
	Three Border 2025, Goal 3 Grants Make Headway in the Circular Economy	39
	Sustainable Use of Biosolids Using Composting Techniques in Ciudad Juárez, Chihuahua	41
	Current Ongoing Goal 3 Projects in Border Communities:	42
Goal 4: IMPROVE JOINT PREPAREDNESS FOR AND RESPONSE TO HAZARDOUS ENVIRONMENTAL EMERGENCIES		
	Update of the Mexico – United States Joint Contingency Plan (JCP)	44
	Emergency Preparedness and Response Public Meeting	45
	Emergency Notifications Along the U.SMexico Border	46
	Meetings and Site Visits	46
	Sister City Joint Contingency Plan (SCJCPs) Evaluations	47
	Periodic Binational Tabletop Exercises and Drills in the Field	48
	First Responder Operation (FRO), First Responder Awareness (FRA), and Incident Command System (ICS) Trainings	48
	Hazardous Waste Operations and Emergency Response (HAZWOPER) Trainings	49
	El Paso/Ciudad Juárez Hazardous Materials Grant and Training	50
	Eagle Pass Train Derailment Exercise	51
Α	dditional Border Projects	52
	Mapping the General Urban Heat and Identifying Urban Heat Island Spots in El Paso, Texas	52
	Transboundary Water Conservation Project: Our Water, Our Future	53
	Current Ongoing Additional Border Projects	53

National Coordinators' Message

To all who make the Border 2025 Program possible,

For the past 40 years, since the signing of the <u>La Paz Agreement on August 14, 1983</u>, in La Paz, Baja California, Mexico, the United States of America and Mexico, committed to join efforts to protect the environment and improve public health in the border region. Today, through the <u>Border 2025: U.S.-Mexico</u> <u>Environmental Program</u>, significant achievements and progress has been made in addressing the serious environmental problems in the U.S. - Mexico border region. Through this program, the United States of America and Mexico, reaffirm the 1983 commitment to promote and strengthen the Program's guiding principles and continue the successful elements from previous binational environmental programs. This document highlights the progress achieved, recognizing the future challenges for the fulfillment of the objectives of the Program.

This *Border 2025: U.S.-Mexico Environmental Program Highlights Report,* summarizes the binational efforts done between 2021 to 2023 to achieve tangible environmental results to improve air quality, water quality, raise awareness and education on sustainable materials practices and build capacity to respond to environmental emergencies. Despite the unique challenge border communities faced from the worldwide Coronavirus (COVID-19) pandemic, the Border Program and its Partners, remained committed to the binational efforts outlined under the framework of the Border 2025 Program.

On behalf of the National Coordinators of the Border 2025 Program, the United States Environmental Protection Agency (EPA) and Mexico's Ministry of Environment and Natural Resources (SEMARNAT, acronym in Spanish), we express our sincere recognition and gratitude to all contributors of this binational effort, especially the representatives of the environmental agencies of the ten border states; the 27 U.S. federally recognized Tribes and the indigenous and Afro-Mexican communities located along the border; the Regional Coordinators, the Policy Workgroup Co-Chairs, and the local regional Task Forces; and partners from academia, industry and non-governmental organizations. To all who have actively committed themselves to this noble cause to set forth a collective vision for improving environmental conditions for all border residents, THANK YOU!

Foreword

At the midpoint, 2021-2023.

The U.S.-Mexico Environmental Program: Border 2025 is the fifth iteration of the border cooperation between U.S. and Mexico under the 1983 La Paz Agreement. It builds on previous binational efforts and environmental programs to continue a regional, community-led approach for decision-making, priority setting, and project implementation. The program's purpose is to identify and address the environmental and health challenges that impact border communities and provide support to address them in coordination with program partners.

Like past Border Environmental Programs, the Border 2025 Program is a partnership between the U.S. Environmental Protection Agency (EPA), the Secretariat for Environment and Natural Resources of México (SEMARNAT, acronym in Spanish), the ten Border States, U.S. Tribes located within the U.S.-Mexico Border, Mexican Indigenous Communities, non-governmental organizations (NGOs), and communities. The Border 2025 Program also embraces a strong partnership with the North American Development Bank (NADBank) to administer EPA's resources to implement projects, to provide technical assistance and support regional and national-level meetings. The Border 2025 program implements small pilot-projects to tackle the joint priorities identified in its four strategic goals: reducing air pollution, improving water quality, promoting sustainable materials and waste management, and clean sites, and enhancing joint preparedness for and response to hazardous environmental emergencies. The implemented projects and capacity building efforts strive to promote and include guiding principles that address climate friendly strategies and solutions and environmental equity in border communities.

This highlights report summarizes completed and ongoing border activities and projects between 2021 to 2023 that support the commitments identified in the Border 2025 program. The range of topics and activities include workshops and webinars on air emissions inventories and e-waste recycling, projects on wastewater treatment system improvements and access to water services, and emergency response trainings, among others. These projects have helped improve the quality of life for border and tribal residents, indigenous and Afro-Mexican communities, and our shared environment. For example, a current air quality project in the Lower Rio Grande Valley region in Texas is helping communities in the area to learn about climate change and public health, specifically on health impacts associated with exposure to air contaminants in areas adjacent to major roadways and highways.

In addition to working on reducing air pollution, improving water quality, promoting sustainable management of materials, waste and clean sites, and improving joint preparedness for and response to hazardous environmental emergencies, the Border 2025 program also promotes projects to address environmental equity among federally recognized Tribes, indigenous and Afro-Mexican communities along the border. For example, funding through the State Environmental Justice Cooperative Agreement will assist the Tohono O'odham Nation in Arizona to develop an air quality plan for the Nation to address the

issue of air pollution affecting the Nation's population. Similarly, a project in Mexicali, Baja California, to improve air quality and transportation systems, will focus on developing tools to incorporate and assess environmental justice as it relates to clean alternative transportation technologies and ways to improve the city's infrastructure conditions to ensure safer public transportation.

For additional information on the goals and objectives of the Border 2025 Program, please see the <u>Border</u> <u>2025 Framework Document</u>. For past accomplishments reports, please visit the Border 2025 Program web areas at <u>EPA</u> or <u>SEMARNAT</u>.



GOAL 1: Reduce Air Pollution

Air Quality, Transportation, and Environmental Justice Analysis in Mexicali

The project led by the University of Texas at Austin, sought to develop tools through data analysis to incorporate and assess environmental justice as it relates to transportation, understanding the urban layout, and to complete a technical viability assessment of alternate transportation technologies in selected bus routes, in Mexicali, Baja California. The goals for this project were to, "support the development of passenger mobility with an integrative and sustainable vision, and reorganize public passenger and load transportation, which point towards the need to assess the population that would benefit from an intervention in transportation infrastructure development." The project concludes with recommendations that point to not only providing a cleaner transportation system but improving the city's infrastructure conditions to ensure safer public transportation. Furthermore, it advocates for further electrified transportation studies for consumers to have a better concept of charging strategies which can open the market for potential investors.







Impact of Nava, Coahuila Coal-fired Plant Emissions

In 2019, the U.S.-Mexico Border 2020 Program provided funds to the Secretariat of the Environment of the State of Coahuila (SMA, acronym in Spanish) to understand the adverse effects of emissions from two electric power generating plants operated through coal burning in the municipality of Nava, Coahuila. These plants, the Jose Lopez Portillo Thermoelectric Plant and the Carbon II Thermoelectric Plant generate 10% of the total electrical energy consumed in Mexico and are less than 40 km from the U.S.-Mexico border. The single air monitoring station in this region is in Piedras Negras, which is too far from the power plants to confidently measure their air quality impacts. Therefore, there has been limited information on the coal-fired power plants' effects on air quality and local public health along the Texas-Coahuila border.

This project consisted of estimating the emissions from the power plants and used meteorological modeling to determine transport, dispersion, and concentration of pollutants within a 150 km and 200 km radius from the power plants.

The project team used data from 2018 to estimate pollutant emissions from power plants by using methods established by EPA and SEMARNAT. Estimates were made for various emitted contaminants with a focus on suspended particles with less than 10 and 2.5 microns in size (particulate matter (PM10 and PM2.5), respectively), and black carbon (BC). Combined emission estimates and meteorological data (i.e., temperature, humidity, atmospheric pressure, rainfall, solar radiation, wind speed, wind direction) was modeled to measure transport, dispersion, and concentration of each of the air pollutants. Incorporating estimates and modeling information with satellite imaging, geographical areas influenced by the power plants were identified.

Based on the modeling, the team identified the communities or populations within a 150 km to 200 km radius of influence (represented in the Figure below) that are potentially exposed to PM and BC emissions from the coal-fired power plants.

As part of the project, SMA hosted three virtual workshops for approximately 400 Nava, Ciudad Acuña and Piedras Negras residents to raise awareness about possible health impacts associated with the air quality in the area. Outreach material related to this project was shared through various social media platforms (Instagram, Facebook, Twitter).



Population potentially impacted by the coal-fired plant emissions (Source: Final project report from SMA)

Strengthening Mexican Emissions Inventories in Baja California and Chihuahua

In 2022, EPA's Office of Air and Radiation (OAR) and Eastern Research Group, Inc. began work on "Strengthening Mexican Emissions Inventories and Related Capacity to Support the Border 2025 Program Air Objectives and Improve Understanding of Mexico-U.S. Transboundary Air Pollution" to enhance EPA's understanding of Mexican inventories and transboundary air pollution originating in Mexico, and to share findings with Mexico's Secretariat of Environment and Natural Resources (SEMARNAT, acronym in Spanish) to further advance the quality of select Mexican state-level emission inventories and improve human health and environmental outcomes along the U.S.-Mexico border. Several communities along both sides of the U.S.-Mexico border share airsheds and have strong economic linkages, such that emissions generating activities in one city can directly affect the other. To date, project partners have reviewed and made technical improvements to the most recent (2018) Mexico National Emissions Inventory (INEM, acronym in Spanish) data for the border states of Baja California and Chihuahua by correcting missing/incorrect point source coordinates, Source Classification Code (SCC) assignments, and emissions

factors, among other improvements. EPA plans to build upon this initial work by supporting similar efforts in Sonora, Coahuila, Nuevo León, and Tamaulipas in the coming year.

On May 23-24, 2023, EPA and SEMARNAT co-hosted a workshop on improving air emissions inventories for Mexican air quality officials and technical experts. Over 50 individuals participated in the event, including representatives from Mexican border states and US border state air agencies. In addition to providing an overview of findings from the aforementioned project, the workshop included a technical training on best practices and lessons learned for emissions inventory development. Representatives from Coahuila, Mexico presented on the use of the Annual Operation Certificate platform in developing emission inventories and an impact assessment for coal-fired plant emissions in Nava, Coahuila. In addition, Mexican border state participants interacted in a roundtable discussion where they shared insights on challenges they often face in preparing inventories, and identified the need for specialized training and enhanced capacity.

Air Sensors Training

EPA's Office of Air and Radiation (OAR) and Office of Research and Development (ORD) developed an Introduction to Air Sensors training that is publicly available in both English and Spanish on ORD's Air Sensor Toolbox of EPA's website. This is an update to the EPA Sensors Training Webinar presented to members of the Imperial-Mexicali Air Quality Task Force and their community stakeholders on September 22, 2020. Air sensors are often more affordable and convenient compared to instruments used for regulatory monitoring. They can be especially useful for non-regulatory, supplemental, and informational monitoring (NSIM) applications, including increasing awareness about local or neighborhood-specific air quality data, hotspot identification, emergency response, and supplementing ambient monitoring networks. OAR designed this training to provide users with critical insight on best practices as air sensors become more popular and widely used. This work further supports Border 2025 Objective 1a: to increase knowledgetransfer and provide training opportunities on performance standards and applications of low-cost air quality sensors. The Introduction to Air Sensors recorded presentation covers a range of topics, including a general overview of air sensors and how they differ from regulatory monitors, potential uses, and applications, how to plan and conduct a study using air sensor data, quality control and assurance, interpreting air sensor evaluations, and data analysis. The training also points to several additional resources, guidebooks, and recommendations available to Spanish speakers interested in furthering their knowledge of air sensor siting, measurement, and interpretation.



Snapshot of Publicly Available Introduction Slide to Air Sensors Training

Binational Collaboration: Key to Improve Air Quality in the Paso del Norte Region

In February 2023, partners of Border 2025 Program led a series of binational events to protect and improve air quality in the Paso del Norte Air Basin. The events occurred in Ciudad Juárez, Chihuahua, and El Paso, Texas.

Federal, state, and local government representatives from both sides of the border, the North American Development Bank (NADBank), as well as private and civil society stakeholders, gathered to participate in an ambitious calendar of events that marked important milestones for ongoing projects in the region.

The events included a workshop on quality assurance and control for air quality data, the first in-person meeting of the Joint Advisory Committee (JAC) since 2020, and the inauguration of the new federal reference monitoring station of the Juárez Network funded by the Binational Air Quality Fund (BAQF).



Inauguration of the new Air Quality Monitoring Site of the Juárez Network

From left to right: Carlos Rincon (EPA), Juan Hernández Paz (UACJ), Daniel Lopez Vicuña (SEMARNAT), Ruben Iguaran (Marathon Petroleum Foundation), V.J. Smith (Marathon Petroleum Foundation), Melissa Zambrano (SEDUE), Guy Donaldson (EPA) and Eddie Moderow (TCEQ).

Created in 2021, the Binational Air Quality Fund created a new station to monitor ozone and particulate matter and is placed alongside a ceilometer and meteorological instruments to improve data analysis and the study of ozone formation. The BAQF is a first of its kind financial mechanism that fosters public-private partnerships to fund network enhancement, expansion, and continuous operations for the benefit of Paso del Norte Residents. Better air quality data will enhance health risk communications and the effectiveness of air quality improvement projects for the region. Because of the BAQF, the Juárez air monitoring network increased in size by 33%. This work contributes to Objective 1b: Develop and implement a sustainable financial mechanism for air quality monitoring in at least one border Mexican state.

85TH Meeting of the Joint Advisory Committee (JAC)

On February 17, 2023, in the Town Hall of Ciudad Juárez, Chihuahua, the JAC met in person for the first time since 2020. The Mayor of Ciudad Juárez, Cruz Perez Cuellar gave opening remarks as did Commissioner Bobby Janecka of the Texas Commission on Environmental Quality (TCEQ) highlighting the importance of the Binational Air Quality Fund (BAQF) and calling members to move towards pollution

reduction efforts. Members proposed working on the creation of a basin wide emission inventory, agreed on the establishment of an air quality excellence award named after Dr. Carlos Rincon and will convene to analyze divergence patterns in 8-hour ozone average values between sister cities.



JAC members and in-person attendees at the Juárez Municipality council room, during the JAC 85th session.

Two-day Workshop on Quality Assurance and Quality Control (QA/QC) for Air Quality Data

The <u>two-day binational workshop</u> held in February 2023, improved understanding between U.S. and Mexican authorities on quality assurance and control procedures for air quality data; strengthened the technical knowledge of network operators and allowed for the exchange of experiences and best practices. Renowned experts and environmental officials provided feedback to the QA/QC procedures of the Ciudad Juárez network. This work supports Border 2025: Objective 1c: Ensure that all air quality agencies operating one or more regulatory air quality monitors have developed a monitoring network plan (ideally in cooperation with other agencies in the same airshed) and a quality assurance project plan.



Mark Berry from the EPA presenting during the El Paso, Texas portion of the QA/QC workshop.

Current Ongoing Air Quality Projects in Border Communities:

Air Quality Assessment: International Bridge of Americas, El Paso, Texas:

The University of Texas at El Paso (UTEP) will be monitoring and assessing air quality conditions and their effects at one of the downtown urban international crossings, Bridge of the Americas (BOTA), in the Paso del Norte airshed, using personal and low-cost sensors that will measure particulate matter (PM_{2.5}) emissions. This project will address both indoor air quality pollution in BOTA workplace installations, and outdoor air quality pollution sources, when monitoring emissions of the idling vehicular traffic on the bridge. Data produced by the monitors and observations made by the projects team at the international crossing will be used to develop Health Risk, Sociological, and Transportation assessments. Data findings of the project will help identify viable and cost-effective options for reducing vehicle emissions with the hopes that these measures are considered for implementation by the regulatory agencies in the future.



Aerial view of the Bridge of the Americas (Photo credit to General Services Administration)

Exposure to air quality deterioration among the population in Piedras Negras and Ciudad Acuña:

The LTM Center for Energy and the Environment, A.C. will be conducting a project using personal air monitoring equipment in areas of high vehicle flow to determine the concentration of air pollutants (particulate matter (PM₁₀, PM_{2.5}) carbon monoxide and black carbon) in the area and identify possible impacts to public health. The project team will determine the concentrations of air pollutants that residents of Piedras Negras and Ciudad Acuña, Coahuila are exposed to in high vehicular traffic corridors and where pedestrian walkways are located. Depending on the findings, walkways with lowest concentrations of pollutants will be proposed as avenues with lowest possibility of exposure to poor air quality among pedestrians, and areas with highest pollutant concentrations. The project team will host a workshop in each city to inform residents of the project findings and educate them on the effects of poor air quality and public health.

Empowering Air Quality Knowledge of the Lower Rio Grande Valley Citizenry:

The University of Texas Rio Grande Valley (UTRGV) will be conducting a project to increase knowledge on air quality indicators such as particulate matter, ozone, carbon monoxide and black carbon, and associated health impacts from exposure. The project will also be engaging the Lower Rio Grande Valley region's communities, specifically, grade school students of all ages, parents, and environmental science teachers to increase knowledge on the overall air quality and associated health impacts among the region's stakeholders, primarily elementary, middle, and high school students at select schools adjacent to major roadways and highways. Low-Cost Sensors would be deployed both in the indoor and outdoor microenvironments of the selected schools. These simple to use instruments will help the students monitor particulate matter pollution in real time on a web-based platform and trained to identify point and area

sources of air pollution in their vicinity. The students will learn the usage of Satellite data for air pollutants to understand overall exposures in context of climate change and public health.

Air Quality Education in west Ciudad Juárez, Chihuahua:

The Universidad Autónoma de Ciudad Juárez (UACJ, acronym in Spanish) will be conducting a project to increase public awareness on the health effects associated with exposure to high levels of ozone and particulate matter (PM_{2.5}) in the El Paso, Texas-Ciudad Juárez, Chihuahua air basin. Low-cost sensors will be used to assess PM2.5 and ozone concentrations in a community center located in the city's western area, which serves a large population of children and youth, who participate in outdoor activities. The project team will conduct a series of workshops to teach residents on the public health impact of poor air quality. In addition, the project team will educate the youth on alternative activities or precautions they should implement when air quality standards are exceeded. Visual aids and screens will be installed at the community center, which will provide information on air quality and display real-time data collected by the sensors. This project will engage and empower the local youth by providing them with the tools to learn, collect, and disseminate information to peers about air quality in their area.



GOAL 2: Improve Water Quality

Pre-treatment of Wastewater with Heavy Metals and Reuse in Nogales

Heavy metals from industrial sources in Nogales, Sonora reach the Nogales International Wastewater Treatment Plant (NIWTP) in Nogales, Arizona exceeding tolerances for efficient operation of the plant resulting in impacts to the water quality of the Santa Cruz River. The Office of Urban Development and Ecology of Nogales, Sonora received a grant from the Border 2025 program, additional financial support from the U.S. section of the International Boundary and Water Commission (IBWC), and in-kind support from the Mexican section of the International and Boundary Water Commission (CILA, acronym in Spanish) to implement a pretreatment and reuse project.

The main objectives of this project are to reduce the concentration of heavy metals in the wastewater from industrial plating processes in Sonora, establish the parameters and conditions under which the discharges of wastewater with heavy metal content from the industrial sector must be regulated by local authorities, and offer pretreatment options to the industrial sector. Nine industrial establishments with metal coating processes and existing pretreatment systems have been selected for sampling and characterization of their wastewater effluent. Sampling began in October 2023.

In addition, the project aims to verify the viability of using plants to reduce the concentrations of heavy metals in the wastewater effluents from the industrial facilities through a pilot project and lab-scale experiments using local plants. A contractor has begun a literature review to identify the plants to be used for the pilot project. The data gathered from these experiments will be used to inform a feasibility analysis for the reuse of industrial water reuse in urban green spaces that complies with reuse regulations.

EPA has been working jointly with the Arizona Department of Environmental Quality (ADEQ), NADBank, Organismo Operador Municipal de Agua Potable Alcantarillado y Saneamiento (OOMAPAS, acronym in Spanish), U.S. and Mexican Sections of the IBWC, and the Office of Urban Development and Ecology in Sonora to address the priority issue of pretreatment for heavy metals in wastewater effluent.



Water quality workgroup representatives and stakeholders from Ambos Nogales celebrating the arrival of portable sampling equipment for the B2025 heavy metals pretreatment project.

Binational Trainings for Sediment Pollution Retention in Sonora and Arizona

Human activities such as urbanization and development, unsustainable groundwater extraction, and the alteration of surface water flows in the Arizona-Sonora border have resulted in increased erosion, sediment pollution, a reduction in the availability of surface water, and detrimental impacts to ecological communities.

Through a grant from EPA's Border 2025 program, the Borderlands Restoration Network (BRN) completed a series of binational sediment retention training workshops in Rancho San Bernardino and Rancho Nuevo in Sonora, Mexico and in Patagonia, Arizona.

The first event, an advanced sediment pollution retention workshop, was held from April 5-9, 2022, in Sonora, Mexico. Participants toured sites with previous sediment-retention restoration structures, spent time constructing sediment-retaining gabion structures, and learned about sustainable grazing techniques to minimize erosion and sediment pollution to waterways.



Workshop participants posing in front of gabion they constructed in Rancho Nuevo, Municipality of Agua Prieta, Sonora (Spring 2022)



Workshop participants learned about sustainable ranching practices to reduce erosion and sediment pollution in downstream waters at Rancho Nuevo, Sonora, Mexico in April 2022

The second event, a beginner sediment retention workshop for practitioners, was held from September 19th-23rd, 2022 in Patagonia, Arizona. Restoration practitioners and members of the San Carlos Apache Tribe learned about watershed restoration, erosion control, and native plant propagation and revegetation. Workshop participants constructed ten erosion control structures, one of which is depicted in the picture below.



San Carlos Apache Tribe and BRN staff posing in front of Zuni bowl that was designed and constructed during the second workshop in September 2022 in Patagonia, Arizona

The third event, a small-scale sediment retention workshop for practitioners, was held from October 3rd-7th, 2022 in Patagonia, Arizona. Workshop participants constructed 42 erosion control structures and distributed 25 pounds of pelletized native seed in the project area, one of which is depicted in the picture below. In addition, two educational videos were produced both in <u>Spanish</u> and <u>English</u>.



Workshop participants constructed erosion control structures in an abandoned road that was experiencing rapid erosion in October 2022 in Patagonia,

The watershed restoration workshops provided 28 participants of all skill-levels with the knowledge and tools to implement restoration work. In addition, the construction of erosion control structures during the training events organized by BRN are helping to decrease sediment pollution in a primary tributary of the Santa Cruz River. This work will mitigate erosion, stabilize soils, and reduce trash and sediment pollution from entering high priority, binational watersheds.

Developing Wastewater Reuse Design on Cocopah Tribal Lands

The Cocopah Indian Tribe implemented an environmental restoration project using the City of Yuma's (COY) treated wastewater effluent that flows through Cocopah tribal lands (see site location map below). The project consists of developing a re-use design to construct a wetland of up to 42 acres to improve water quality through natural filtration and increase riparian plant life.

The development of the re-use wetland design will be driven by results from soil assessments of selected tribal lands and water quality analyses of the COY's wastewater effluent. The resulting increase in riparian plant life is expected to enhance habitats for native and migratory wildlife.

In 2022 and early 2023, the project team completed site base and topography maps using lidar data from the Bureau of Reclamation, conducted soil sampling, and finalized a water quality assessment. A restoration consultant completed a final restoration design in April of 2023. The design includes routing of the effluent stream to flow throughout the 42-acre project, constructed riffles to promote aeration of the water to increase dissolved oxygen levels, beaver dam analogues and ponds, and a planting design to accommodate four habitat types including aquatic, wetland, riparian, and upland areas. The design also includes recreational and cultural features such as an elder's village, a pollinator and medicinal plant garden, and a 1.7-mile walking trail. The team produced a video on the project which can be viewed <u>here</u>.



Site location map for Cocopah constructed wetland using the City of Yuma's treated effluent.

Goodenough Spring Catchment Area Characterization, Amistad Reservoir, Rio Grande Valley

The Southwest Research Institute worked with U.S. and Mexican Federal and State partners to help delineate the Goodenough Spring Catchment Area by the Amistad Reservoir in Texas. The project team aimed to help stakeholders in the region better understand the catchment area to effectively manage and protect it for long term-use sustainability.

Ten wells in Texas and Coahuila as well as Goodenough Spring were sampled for a comprehensive suite of geochemical parameters including major ions and isotopes, with the isotopic analyses for the Coahuila portion of the study area being the first of their kind. Sampling sites and project team collecting samples are depicted below. Water analysis showed similarities in ion chemistry between the waters of Goodenough Spring and the waters of wells on both sides of the border. Examination of the available chemistry data for Goodenough Spring and wells in the region suggested that the source area of Goodenough Spring may be transboundary in nature, with the upland regions of nearby watersheds in Mexico perhaps comprising the main components of this source area.



Sampling location map from wells in Texas, Coahuila and Goodenough Spring Catchment area

The project concluded that additional research, particularly additional data collection in Coahuila is needed. Based on current data, however, protection of the quality and quantity of water discharged from

Goodenough Spring will require coordinated management strategies between the United States and Mexico.



Project team taking water samples at the Goodenough Spring Catchment area and surrounding wells.

Binational Agreements to reduce Transboundary Water Pollution in San Diego and Tijuana

In July 2022, binational discussions to implement priority infrastructure projects and their associated cost shares were memorialized in two agreements signed by U.S. and Mexican federal agencies. On July 1, 2022, EPA's Office of Water Assistant Administrator Radhika Fox signed the Statement of Intent alongside her counterpart in CONAGUA (Mexico's National Water Commission), Dr. Humberto Marengo. This document serves as a binational framework listing short- and long-term projects to stem the flow of transboundary pollution in the San Diego/Tijuana region. The second binational agreement, Minute 328, was signed by the US and Mexican sections of the International and Boundary Water Commissions (IBWC and CILA, respectively) on July 19, 2022. This agreement is the first step in binational implementation of the Statement of Intent framework and includes the projects to be implemented to address the transboundary flow issues as well as operations and maintenance cost-sharing for the proposed expansion of the South Bay International Wastewater Treatment Plant (ITP). The agreements outline sanitation projects to be constructed in San Diego and Tijuana using \$330 million dollars from the U.S. government, funded through United States-Mexico-Canada Agreement (USMCA) and the Border Water Infrastructure Program (BWIP) for Drinking Water and Wastewater Infrastructure Projects for the US-Mexico Border Populations, and \$144 million dollars from the Mexican government. On August 18, 2022, EPA and the IBWC hosted a ceremony at the Tijuana Estuary in Imperial Beach to celebrate the signing of these two agreements and the exchange of diplomatic letters notifying the entry into force of Minute 328.

EPA continues to hold monthly meetings with Mexico to discuss progress on the implementation of the Statement of Intent and Minute 328. Agencies participating include EPA, CONAGUA, USIBWC and CILA, NADBank, the Baja California State Government, and others. Rehabilitation of the Oriente Collector, one of the projects outlined in Minute 328, was completed in summer of 2023. This project mitigates the risk

of 7.1 million gallons per day of untreated wastewater discharges to the Tijuana River and was funded through the NADBank's Border Environment Infrastructure Fund (BEIF) with matching funds from Mexico.



Statement of Intent Ceremonial Signing on August 18, 2022, at the Tijuana Estuary in Imperial Beach (On the left: Bruno Pigott, EPA; on the right: Jose Gutierrez, CONAGUA)

Current Ongoing Water Quality Projects in Border Communities:

Lower Rio Grande Valley (LRGV) Real Time Surface Water Monitoring Pilot Program:

The Research, Applied Technology, Education, Services, Inc. (RATES) will be conducting a pilot project for an early flood warning system; a tool to evaluate real-time monitoring of water bodies to assist in prompt decision-making during storm events. The team will deploy one Real Time Hydrologic Station (RTHS) in the LRGV to understand the hydrological behavior in the region. The end goal of the project is to help facilitate inter-jurisdictional collaborations and holistic flood, water quality and ecological management in the LRGV area. The project team will also develop a website to promote the RTHS pilot program and disseminate information through six workshops to residents in the counties of Willacy, Hidalgo and Cameron, Texas.

Lower Rio Grande (LRG)/Bravo Two-Day Salinity Level Forecast using Artificial Intelligence:

The University of Texas Rio Grande Valley (UTRGV) received funding to develop an online Artificial Intelligence (AI) salinity forecast tool for water users of the Lower Rio Grande, where salinity levels have slowly been increasing and impacting agricultural production. The AI tool will utilize data such as subbasin rainfall, monitored water temperature and river discharge housed by the Texas Commission on

Environmental Quality (TCEQ), National Oceanic and Atmospheric Administration (NOAA), U.S. section of the International Boundary and Water Commission (IBWC) and its Mexican section (CILA, acronym in Spanish) for generating the forecast data. On-site trainings/presentations will be carried out on how to use this online forecasting tool to the Texas Counties of Willacy, Hidalgo, and Cameron.

Strengthening Governance to Safeguard the Rio Grande in Coahuila/Nuevo León/Tamaulipas:

The Pronatura Noreste, A.C. received funding to develop a project aimed to develop a mobile application (app) with geographical or mapping features, for communities along the Rio Grande or its tributaries to report environmental concerns that directly affect the water quality of these water sources. The app will serve as a tool to improve communication between these communities and Mexico's water regulating agencies. Residents of these communities will be able to do water surveillance and report water quality concerns. At the same time, regulating agencies will be able to send mass notifications when water quality may be a threat to public health. A series of in-person workshops, along with online virtual training will be provided to the communities of Chihuahua, Piedras Negras, Monterrey and Reynosa, to educate them on the use of the app.

Decentralized Onsite Wastewater Treatment Facility Survey and Community Education:

Communities Unlimited Inc. received funding to conduct a project to survey failing or absent Decentralized Onsite Wastewater Treatment Facilities (OWTF) in areas of large minority populations of moderate to lowincome households in Hidalgo County, Texas. A community outreach and bilingual education campaign will be carried out to educate rural and Colonia homeowners on the importance of and best management practices for properly maintaining OWTF to eliminate the discharge of untreated sewage into the Rio Grande River watershed. A direct impact of this project will be improving resident's knowledge on the environmental health impacts of improperly maintained septic tanks.

Applying Hydrogeochemistry to Refine Hydrologic Conceptualization of Amistad Reservoir Region:

The Southwest Research Institute (SwRI) will be conducting a project that builds upon a Border 2020 Program project from 2019 on the Goodenough Spring in the Texas – Coahuila geographic area. The goal of the project is to develop a more robust hydrologic characterization of the water resources of the Amistad Reservoir, depicted below with an emphasis on filling in critical data gaps pertaining to the Mexican state of Coahuila bordering with Val Verde County, Texas region. Additional water samples will be collected from wells, springs, and surface-water in the Texas-Coahuila border, to expand the understanding of the region's hydrogeochemistry and water quality and aid water agencies in making decisions to better protect these water resources. Project results will be shared with binational partners in the region.



Overlooking the Amistad Reservoir

Rain Harvesters in the San Pedro River Basin, Sonora:

The Watershed Management Group located in Arizona, received funds to teach community members rainwater harvesting techniques and improve water security in four ejidos (communal form of land tenure) in the San Pedro River watershed. Efforts will include holding 4 to 5 workshops to train participants in designing and installing rainwater collection systems in each ejido and use them as demonstration projects. Rainwater would be used for livestock, vegetable gardens, fruit trees, etc.

Border Environment Infrastructure Fund (BEIF) PROJECTS

EPA's Office of Water funds, administers, and leads the U.S.-Mexico Border Water Infrastructure Program (BWIP) for the region 100 kilometers (62 miles) north to 100 kilometers south of the U.S. -Mexico border. The BEIF program under BWIP offers grant financing exclusively for the implementation of high-priority municipal drinking water and wastewater infrastructure projects.

Rehabilitation of the Collector Oriente in Tijuana, Baja California

The project consists of the rehabilitation of the Buena Vista section of the sewer main known as the Collector Oriente, which extends approximately 4,416 ft. The project will significantly reduce exposure to untreated wastewater and potential contamination of surface and groundwater by reducing the risk of line failures, thereby preventing the potential discharge of approximately 7.1 million gallons daily (mgd) of wastewater that could affect the Tijuana River.



Region 9 Regional Administrator Guzman at the site

Improvements to the International Outfall Interceptor: Relocation of Lateral Connections and Erosion Protection in Nogales, Arizona

The International Outfall Interceptor (IOI) conveys water from the Nogales, Sonora wastewater collect system and the Nogales International Wastewater Treatment Plant (NIWTP) in Rio Rico, Arizona. It was built 50 years ago using reinforced and unreinforced concrete pipe. The IOI has exceeded its useful life and is showing signs of structural deterioration, including corrosion, cracks, and wall penetrations. Because of this deterioration, it has been experiencing operational problems, such as groundwater inflow and infiltration and root intrusion, which has resulted in pipeline and manhole failures with untreated discharges to the Nogales Wash.

The project consists of the abandonment of five substandard lateral connections to the IOI and the relocation of three of those connections to the nearest manhole on the IOI. This was completed in January of 2022. The project also includes erosion protection for vulnerable segments of the IOI within the Nogales Wash and was completed in April 2023.



Map of plan activities at the International Outfall Interceptor (IOI) in Nogales, Arizona

The project will help reduce the risk of pipeline failures in the IOI, thereby preventing the potential discharge of up to 15.2 million gallons per day (mgd) of untreated or inadequately treated wastewater to the Nogales Wash, a tributary of the Santa Cruz River. It will improve wastewater collection and wastewater treatment services for up to 8,000 homes and protect vulnerable segments of the IOI and other municipal infrastructure by providing bank and erosion protection in the Nogales Wash consistent with the 100-year flood standard.

Southwest Colonias Lift Station Improvements in Nogales, Sonora

This project is expected to benefit 16,701 residents by receiving and conveying flow from the Nogales, Sonora Southwest Colonias and other areas to the Los Alisos Treatment Plant. The Estadio Lift Station Improvements are separated into two phases. Phase 1 includes civil improvements and sand/grit removal. Those improvements were completed in February 2023. The second phase includes installation of a backup generator and mechanical and electrical control. Construction was completed in June 2023.



Construction progress for the SW Colonias Lift Station Improvements, Nogales, Sonora, October 2022

Wastewater Collection System (Phase I) and Lift Station Improvements in Mexicali, Baja California

The project includes replacement of 34,467 ft of deteriorated pipeline in the wastewater collection system and rehabilitation of Lift Stations No. 2, 4 and 5 (see Figure below).



Map depicting locations of lift stations #2,4, and 5 under construction in Mexicali, Baja California

The project will provide adequate infrastructure to collect the wastewater flows and safely convey them to the existing treatment plant. The rehabilitated infrastructure will improve system reliability by reducing the risk of pipeline failures that can cause sewage overflows onto local streets and into the New River, which flows northward into the United States. It will mitigate the risk of 33.1 mgd of untreated wastewater

discharges into the New River. The rehabilitation of the wastewater collection system was completed in 2022, and the lift station rehab is currently under construction with an expected completion date of June 2024 (see picture below).



Construction work at Lift Station #4 – Spring 2022

Rehabilitation of Small Lift Stations in Mexicali, Baja California

The project consists of the rehabilitation of 12 small lift stations: Aurora, Calle G, Campestre, Centro Civico, Cipresito, Esperanza Agricola, Hidalgo, Jardines del Lago, Nueva Esperanza, Zacatecas, San Marcos, and Coronado (see map below). Rehabilitation works also include building improvements, such as updates to the control room, wet well rehabilitation, installation of travel hoist equipment, a perimetral fence and site improvements to accommodate access for vacuum trucks.



Map of 12 lift stations selected for rehabilitation in Mexicali, Baja California

The project will provide adequate infrastructure that will safely convey wastewater flows to the existing treatment plants. The rehabilitated infrastructure will improve system reliability by reducing the risk of

pump failures that could cause sewage overflows onto local streets and into the New River, which flows northward into the United States. Specifically, the project will help protect public health and the environment by preventing approximately 8.7 million gallons per day of wastewater discharges. The Centro Civico, Calle G, and Esperanza lift stations have been completed (June 2023), and the remaining 9 are currently under construction.

Completed construction at Centro Civico Lift Station

Construction underway at Hidalgo Lift Station

Water System Improvements Project in Presidio, Texas

This project completed in November 2021 provided first-time access to water services for 10 households and seven businesses along Highway 67, benefiting 4,000 residents. Installation of the waterline is depicted below. The sustainability of the entire system was increased by improvements that reduced pressure in the waterlines, preventing at least 80,000 gallons a day in water losses from frequent line breaks and leaks, as well as the potential for contamination of the water supply.

Waterline installation in Presidio, Texas

Wastewater Collection and Treatment Project in Camargo, Tamaulipas

Completed in September 2021 and benefiting 8,819 residents, this comprehensive wastewater improvement project included construction of a new treatment plant with the capacity to produce effluent for agricultural purposes, and expansion of the wastewater collection system to two unserved areas, providing first-time service to an estimated 890 residents. These improvements have reduced the risk of groundwater and surface water contamination, including in the San Juan River, which is a tributary of the Rio Grande.

Wastewater Collection System in Camargo, Tamaulipas

Wastewater Collection and Treatment Project in Reynosa, Tamaulipas

The project completed in August 2021 and benefiting 286,853 residents included the expansion of the Wastewater Treatment Plant (WWTP) No. 2, to increase capacity from 5.7 mgd to 17.1 mgd, as well as construction of Lift Station No. 278, rehabilitation of Lift Station No. 1 (as depicted in the pictures below) and decommissioning of three lift stations. Expansion of wastewater treatment coverage, preventing untreated sewage discharges from entering the Rio Grande River, which will reduce environmental pollution and the risk of waterborne diseases, thus providing a safer and healthier source of water for the city, as well as for downstream users. Specifically, an estimated 9.0 mgd of wastewater will be collected and treated.

Lift Station No.278

Lift Station No. 1 Manifold

Rehabilitation of the Collector Poniente: Segment 1A in Tijuana, Baja California

Rehabilitation of the final segment of this major sewer main (as shown in the picture below), along with repairs to connect a collapsed segment of the Cañón del Sainz-Los Reyes sewer line to the main, are

preventing the potential discharge of up to 6 million gallons a day of untreated wastewater that could flow into the Tijuana River, thus reducing the potential for transboundary flows. This project, completed in May 2021, benefits an estimated 87,000 residents in Tijuana, Baja California.

Installation of the last segment of the major sewer main in Tijuana, Baja California

Bay Acres Wastewater Collection System and Wastewater Treatment Plant Expansion in Douglas, Arizona

The new sewer system, along with the closure of the failing on-site septic systems has eliminated wastewater discharges to streets, backyards, and alleyways in the Bay Acres subdivision, while improvements to the Douglas Wastewater Treatment Plant have increased the quality of the effluent that is discharged across the border in Agua Prieta, Sonora, pursuant to international agreements. This project, completed in April 2021, benefited 17,378 residents in Douglas, Arizona.

Improvements to and expansion of the existing WWTP in Douglas, Arizona

Groundbreaking Ceremony of Phase II New Drinking Water and Wastewater System in Vinton, Texas

On January 27, 2022, EPA Region 6, NADBank and the Texas Water Development Board (TWDB) broke ground on phase II of a new drinking water and wastewater system that will help reduce public health risks

and provide reliable service to the Village of Vinton, Texas. EPA Region 6 through the NADBank will be funding the wastewater project which will provide first-time service to approximately 506 homes who up to now have been relying on septic tanks. The new sewer system will collect and convey nearly 275,000 gallons per day of sewage to the John T Hickerson Wastewater Treatment Plant (WWTP), which is operated by El Paso Water (EPW). The Project includes the installation of household connections and the decommissioning of existing on-site systems. The TWDB will be funding the water system which is expected to provide drinking water to 360 households.

Left to right: Temis Álvarez (NADBank), Charles Maguire (EPA Region 6 Water Division Director), Dr. Earthea Nance (EPA Region 6 Regional Administrator), James O'Brien (NADBank) and Gilbert Tellez (EPA)

GOAL 3: Promote Sustainable Materials Management and Waste Management, and Clean Sites

Waste Policy Workgroup 2022 and 2023 Binational Meetings

In March 2022, the Waste Policy Workgroup held its first binational meeting to advance Border 2025 objectives for waste. The meeting drew over 200 participants from both Mexico and the United States and combined they represented federal, state, municipal and city agencies, Tribes, Universities, non-profit organizations, and waste solution companies. Opening remarks were presented by the Workgroup Co-Chairs from Mexico's Secretariat for the Environment and Natural Resources (SEMARNAT, acronym in Spanish) and Environmental Protection Agency (EPA). An overview of EPA and SEMARNAT's priorities for waste included reduction of marine litter and plastic pollution, circular economy, environmental justice, and climate change. NADBank presented the Bank's perspective on needs and trends in the Border region. During an open discussion session participants provided their thoughts on issues and topics that would be a good basis for cross-border virtual meetings and programming that could further the objectives of the Workgroup.

The second binational meeting of the Waste Policy Workgroup was held on August 29, 2023. Nearly 100 interested parties from the United States and Mexico participated in the call. After opening remarks from the Workgroup Co-Chairs, US EPA shared program updates, activities-to-date and upcoming events and initiatives. SEMARNAT concluded the session with a productive facilitated discussion to solicit feedback on priority issues and ideas that will inform and further the work of the Waste Policy Workgroup.

Consultative Mechanism

The Consultative Mechanism is a requirement of the Border 2025 program for the exchange of information related to the management of hazardous waste infrastructure in the border area. EPA provided SEMARNAT with its updated Consultative Mechanism documents in October 2022 which reflect the current hazardous

waste, spent lead acid batteries, and electronics recycling facilities along the U.S. border region. A map showing the location of these facilities was also provided. SEMARNAT is currently working on its Consultative Mechanism Update.

Webinar: Challenges and Best Practices in Sustainable Electronic Waste Recycling

On May 17, 2023, the Goal 3 Policy Workgroup Co-Chairs, in collaboration with EPA Region 9, co-hosted a Webinar on challenges and best practices in sustainable electronic waste recycling. With over 70 participants in attendance, speakers included national experts from the National Center for Electronics Recycling and Cascade Asset Management (a U.S.-based e-recycler) who discussed best practices for e-Waste Recycling. Officials from the Secretaría Desarrollo Urbano y Medio Ambiente del Estado de Tamaulipas and California Department of Toxic Substances Control discussed challenges with e-Waste management.

California-Baja California Waste and Materials Management Workshop

On June 8, 2022, California Department of Toxic Substances Control (DTSC) and Baja California Secretariat of the Environment & Sustainable Development (SMADS, acronym in Spanish), co-chairs of the Goal 3 Task Force, in coordination with EPA, held a virtual workshop for U.S.-Mexico cross-border shippers of hazardous waste, as well as importers/exporters, brokers, recyclers, inspectors and government. The audience learned about management of used catalytic converters, import/export of both universal and electronic waste, EPA's regulated imports, and SMADS's regulations for 'specially managed waste'. CalRecycle presented its programs on retread tires and managing of waste tires along the border and funded various tire cleanups. The workshop was the third in a series of compliance assistance workshops on hazardous and solid wastes and materials.

CalRecycle-funded Tire Clean-up. California Region, Summer 2021.

Arizona-Sonora Goal 3 Task Force Meetings

In 2022, the Arizona-Sonora Goal 3 Task Force held two meetings, one virtual and one hybrid. On October 6th, in conjunction with the Regional Coordinators Meeting also taking place at that time, task force cochair Arizona Department of Environmental Quality (ADEQ) and co-chair the Sonoran Commission of Ecology & Sustainable Development (CEDES, acronym in Spanish), in coordination with EPA, held the Goal 3 Task Force Meeting in Nogales, Arizona. CEDES provided updates on its law regarding single-use plastics, and the National Park Service presented on its initiative to rally the community in cleaning up bottle dams in Tumacácori National Historical Park and identify long-term solutions. On May 26th, the Task Force held a virtual meeting during which ADEQ shared updates on its efforts to establish a 'hub & spoke' recycling program, including on tribal lands.

Task Force Leads discussion of agenda topics in October 2022 in Nogales, Arizona

Webinar: Sustainable Management of Food on the U.S.-Mexico Border

In order to address food loss and waste on the U.S.-Mexico Border, Region 9 hosted a webinar on April 12, 2023, on sustainable management of food. The webinar, with 77 attendees, featured several food-related presentations including presentations from the trinational Commission for Environmental Cooperation on cross-border examples of food management, the State of Sonora Commission on Ecology & Sustainable Development on anaerobic digestion studies in Sonora, and the not-for-profit, Mexicali-based Compóstate Bien, which runs a commercial and residential food scraps collection and composting service. In the picture below, food scraps are being prepared for composting at the organization's facility.

Preparing food scraps for composting at Compóstate Bien in Mexicali, Baja California. October 22, 2021

Three Border 2025, Goal 3 Grants Make Headway in the Circular Economy

Three Border 2025 grant recipients (the Institute for Environmental Planning and Quality of Life, the Environmental Health Coalition, and the Environmental Education Border Project) are making progress on solid waste cleanup, prevention and recycling efforts in local communities and watersheds. The Institute for Environmental Planning and Quality of Life (INPACVI, acronym in Spanish) completed its year-long project to build and launch a recycling and composting center. Based in San Antonio Nécua, Ensenada, home of the Kumiai tribal community, the project strengthened the community's capacity for sustainably managing its residential solid waste through an Integral Center for Solid Waste Management and Beneficial Reuse (as seen in the picture below).

Separation, Cleaning and Weighing of Recyclables at San Antonio de Necua. November 25, 2022

The Environmental Health Coalition (EHC) carried out a Waste Analysis and Socio-Environmental Vulnerability study along the Alamar River in Tijuana. This included GPS mapping of illegal dumpsites, and volunteer-driven Cleanup Days for the forested area of the river, resulting in over 1 ton of trash collected. Next steps include an advanced formal declaration to designate the Alamar as a protected natural zone.

Community members provide input on Socio-Environmental Vulnerability study - 2022

The Environmental Education Border Project (PFEA, acronym in Spanish) coordinates an urban waste management and cleanup project in the Colonia Anexa Miramar, in Tijuana. Efforts have

included a waste characterization and volunteer-driven cleanups of abandoned trash resulting from a lack of trash collection services due to a landslide blocking the road. Efforts will continue into 2024 in coordination with NADBank.

Community members engage in a PFEA-led trash removal event - 2022

EPA's Region 9 Office, in coordination with Office of Tribal and International Affairs (OITA), planned a visit by EPA Deputy Administrator Janet McCabe to visit the community with EHC and PFEA representatives in May 2022, as depicted here.

EPA Deputy Administrator Janet McCabe in Tijuana, Baja California with R9 colleagues and Border 2025 grant recipients in May 2022

Sustainable Use of Biosolids Using Composting Techniques in Ciudad Juárez, Chihuahua

Ciudad Juárez, Chihuahua wastewater treatment facilities produces 69,350 cubic meters (m³) of sewage sludge or biosolids every year through their wastewater treatment processes. Over the years, approximately 150,000 m³ of this biosolid has accumulated at the South Wastewater Treatment Plant. Added to this waste, is organic mulch from park pruning, of which approximately six tons are generated daily.

The Ciudad Juárez Municipal Water and Wastewater Utility (JMAS form, acronym in Spanish) received a U.S.-Mexico Border 2020 Program grant to implement a compost sustainable program for city parks and rural green spaces by utilizing a mixture of wastewater treatment plant's sewage sludge and urban park's organic mulch biosolid waste. The overall project goal aimed to improve the quality of the soils in parks and green spaces by finding an ideal compost mixture that would help reduce the use and amount of chemical fertilizers and water that is currently applied in these green spaces for growth.

Biosolid piles at the wastewater treatment plant in April 2021

The project team coordinated with the city's Directorate of Parks and Gardens, to receive organic mulch from park pruning, gathered from different parks in the city. This park pruning material was broken down into small chips using a wood-chipper machine and combined with the biosolid sludge to form composting piles of various sizes ranging from 1.7 m³ for small piles to 26 m³ for large ones. During the composting process, compost samples were collected for physicochemical and microbiological profiles carried out in the JMAS labs and the environmental science laboratory at the Instituto de Ciencias Biomedicas (ICB, acronym in Spanish) – Universidad Autonoma de Ciudad Juárez (UACJ, acronym in Spanish). Once compost piles were confirmed to be of suitable quality through laboratory analysis, the project team applied compost to green areas within the JMAS wastewater treatment plant in Anapra and coordinated with the city's Directorate of Parks and Gardens to apply in five different selected parks throughout the city. The

project team exceeded their initial goal by more than double, producing a total of 248 tons of compost where the majority of this was of suitable quality for applications in urban areas according to Mexican federal regulations.

The project team promoted this work to municipal authorities, focusing on the advantages of improving park soils using compost. As a result, the municipality commented that park committees will be formed between neighboring groups to promote community involvement in park improvement. All compost of suitable quality was applied in some of the city's recreational areas, promoting forestation, while reducing water consumption for irrigation. This project was broadcasted through news outlets on July 23, 2021: https://www.youtube.com/watch?v=H4DBDfrW1zg

Current Ongoing Goal 3 Projects in Border Communities:

Environmentally Responsible Rural Communities in Matamoros:

The city of Matamoros, Tamaulipas will be conducting a project that will focus on raising awareness in five rural communities in Matamoros on proper waste management and sustainable environmental practices. Each community will have waste containers installed with the goal of reducing illegal dumping in these communities. Educational workshops will be implemented to inform residents about best waste management practices, uses of pesticides and how they can take advantage of their natural resources while minimizing environmental impacts. The project team will also build community gardens for the communities while teaching them about composting.

Urban Solid Waste Management Plan for the Landfill in the Municipality of Ciudad Juárez, Chihuahua:

The Public Works Department within Ciudad Juárez, Chihuahua will be conducting a project to develop an Urban Solid Waste Management Plan for the landfill in the Municipality of Ciudad Juárez, Chihuahua. The project team will conduct a diagnostic of the current waste management strategies, identifying waste streams and analyzing applicable recycling technologies. The results of the diagnosis will be used to determine more efficient and optimal practices suitable for Ciudad Juárez, which will focus on achieving a circular economy as well as reducing environmental impacts. Once the project team establishes an Urban Solid Waste Management Plan, they will work towards registering and publishing the plan under the municipal ordinances.

Goal 4: IMPROVE JOINT PREPAREDNESS FOR AND RESPONSE TO HAZARDOUS ENVIRONMENTAL EMERGENCIES

Since 2021, Goal 4 supporting partners have made meaningful strides to achieve the Goal's objectives under the Border 2025 framework. Below are recent accomplishments associated with each objective.

El Paso, Texas firefighters during a training exercise at a railyard in May 2021

In November 2022, EPA released its <u>U.S.-Mexico Border Program 2025 Goal 4: Emergency Response and</u> <u>Preparedness StoryMap</u>, which visually depicts the shared efforts along the border to prepare for and respond to hazardous environmental emergencies as depicted in the snapshot below. Users can visualize hazardous incidents along the border, population densities, previous responses, and details on crossborder training and exercises. EPA released In February 2023 the <u>Spanish Version of the StoryMap</u>.

Snapshot of the Border 2025 Goal 4 StoryMap

Update of the Mexico – United States Joint Contingency Plan (JCP)

On January 12, 2023, U.S. and Mexican officials launched efforts to update the Mexico-United States JCP for the first time since 2017. The launch included 14 participants from EPA's OEM, Region 6, and Region 9, in addition to officials from SEMARNAT, PROFEPA, Mexico's National Center for Disaster Prevention (CENAPRED, acronym in Spanish) and National Coordination for Civil Protection (CNPC, acronym in Spanish). Updating the JCP will reinforce the emergency notification system and processes, including affirming points of contact and preferred notification procedures. Recent developments include the U.S. completing its update of the plan content and design. The U.S. will provide the translated document to Mexico for revision and approval. This group will continue to work collaboratively to update and finalize a new JCP.

2017 Joint Contingency Plan

Emergency Preparedness and Response Public Meeting

On March 16, 2022, U.S. and Mexican officials held a virtual public meeting to Improve Joint Preparedness and Response to Hazardous Environmental Emergencies. EPA's Office of Emergency Management (OEM) and officials from Secretariat for the Environment and Natural Resources the Federal Attorney General for Environmental Protection (PROFEPA, acronym in Spanish), as well as National Coordination for Civil Protection (CNPC, acronym in Spanish) jointly hosted the meeting. Additional EPA participants included Regions 6 and 9, EPA's Office of International and Tribal Affairs (OITA), and the Office of Environmental Justice (OEJ). Presenters provided background on the Border Program and emergency response along the border, and hosted a discussion on recent achievements, current projects, and upcoming priorities such as environmental justice. Over 150 binational participants attended, including federal government representatives, local officials, first responders, private industry, and public stakeholders.

On August 22, 2023, U.S. and Mexican officials held a virtual public meeting to Improve Joint Preparedness and Response to Hazardous Environmental Emergencies. EPA's Office of Emergency Management (OEM) and officials from Mexico's Ministry of the Environment and Natural Resources (SEMARNAT), the Federal Attorney General for Environmental Protection (PROFEPA), as well as National Coordination for Civil Protection (CNPC) jointly hosted the meeting. Additional EPA participants included Regions 6 and 9. Presenters provided background on the Border Program and emergency response along the border and hosted a discussion on recent activities. Over 100 binational participants attended, including federal government representatives, local officials, first responders, private industry, and public stakeholders.

Emergency Notifications Along the U.S.-Mexico Border

To meet Goal 4's objective 1 to "Update the JCP and evaluate the emergency notification system at the U.S.-Mexico border" the U.S. National Response Center (NRC) notified Mexico of a total of 1,498 emergencies between 2021 and September of 2023. The notifications were made through the Center for Guidance and Attention to Chemical Emergencies (COATEA) of PROFEPA and the National Communications Center (CENACOM), of the National Coordination of Civil Protection, which then notified Mexico's counterpart states. During the same period Mexico notified the NRC of 49 emergencies that occurred in the U.S.-Mexico border.

Map of National Response Centers in Mexico and the U.S.

Goal 4 Border 2025 Task Force leads at the Nogales, Arizona Fall 2022 meeting.

From November 20-23, 2022, EPA's OEM and Region 9 staff traveled to multiple sites along the border of Arizona and Sonora to hold in-person meetings, visit sites of future exercises, and provide awareness of local needs and areas for improvement. These site visits bolstered the relationship between national and local officials and provided inputs for meeting Goal 4 objectives. In Douglas, Arizona a technical Goal 4 Task Force Meeting focused on local issues, emergency responder training programs, and details on a future full-scale, binational exercise. The visit to Ambos

Nogales included a tour of the city Emergency Operations Center (EOC), the border crossing to Mexico, as well as the Nogales train yard, which will serve as the future site of a binational full-scale exercise. The trip also included a meeting with Professor Al Brown at Arizona State University who is leading a study into the Sister City Joint Contingency Plans (SCJCPs).

Meetings and Site Visits

Figure 1Participants at the binational meeting in Nogales, Arizona Fall 2022

Sister City Joint Contingency Plan (SCJCPs) Evaluations

There are more than 9 million people living in 15 sister cities within the entire United States-Mexico region. Additionally, there are more than 1.6 million employees working in manufacturing facilities along the U.S. – Mexico border. The SCJCPs recognize the importance of cross-border response, and the coordination of shared resources and workforce during a hazardous emergency. However, many of the SCJCPs have not been updated or revised in five to ten years. An analysis of six Sister City Joint Contingency Plans, within the border region California – Baja California and Arizona-Sonora, was performed to determine their current effectiveness in responding to hazardous substance releases. The findings determined that the plans were adequate, but not sufficient for ensuring the full and effective utilization of resources essential

to protect the public health, safety, and the environment within the border regions. recommendations Furthermore. for provided during improvement were the evaluations to aid in hazardous risk analysis planning efforts, preparedness, training, coordination of resources and mutual aid between federal, state, and local officials from the United States and Mexico, responding to a hazardous emergency.

Periodic Binational Tabletop Exercises and Drills in the Field

To meet Goal 4's Objective 2, "Review, update, and evaluate the Sister City Joint Contingency Plans of Sister Cities (SCJCPs)" the Sister Cities along the U.S.-Mexico Border carried out a total of 127 binational chemical emergency drills. Of these drills, 122 were notification and five were in the field, the latter carried out in Agua Prieta, Sonora, Juárez and Ojinaga, Chihuahua, Reynosa and Matamoros, Tamaulipas.

In addition to the drills carried out in the Sister Cities, the remaining municipalities that make up the U.S.-Mexico border, PROFEPA supported 212 chemical emergency drills in the field. These drills were carried out by the national public and private sectors, with the state of Tamaulipas contributing the majority with 30% of the total.

Ojinaga, Chihuahua – Presidio, Texas Binational Drill, July 14, 2023

Reynosa, Tamaulipas – McAllen, Texas Binational Drill, July 14, 2023

First Responder Operation (FRO), First Responder Awareness (FRA), and Incident Command System (ICS) Trainings

EPA Region 9 supported numerous binational training and capacity building activities in Sister Cities across the border, training over 300 responders. From April 18-22, 2022, 37 responders in the Mexicali, Baja California region participated in training opportunities for FRO, FRA, and ICS. Participants included state police personnel from Mexicali, Ensenada, and Tijuana; Firefighters from Mexicali; several local emergency call center operators; safety workers from several maquiladoras, and others. From September 26-30, 2022, 82 individuals participated from the Mexicali fire department, maquiladoras, the State Health Department, Federal Attorney General for Environmental Protection (PROFEPA, acronym in Spanish), and others. From November 14-18, 2022, 72 participants from 13 different agencies; city, state, federal and maquiladoras were trained.

In Santa Ana, Sonora FRO, FRA, and ICS courses were offered from July 17-21, 2023. In total, 137 personnel participated across the sessions. Trainees included firefighters from Santa Ana and Magdalena de Kino as well as the State Fire Office; Red Cross crews from Santa Ana and Benjamin Hill; emergency management personnel from the State Office, Santa Ana and Benjamin Hill; the National Guard (i.e., Federal Highway Police); and local public safety officers.

Photos of the Mexicali Training in April (left) and September (right)

Hazardous Waste Operations and Emergency Response (HAZWOPER) Trainings

On September 28 – 30, 2022 and October 26 – 30, 2022, EPA Region 6 Border Staff and Superfund Staff worked with state counterparts at the Texas Commission on Environmental Quality (TCEQ) to organize virtual Spanish-language HAZWOPER trainings for emergency response personnel in the Mexican states of Chihuahua, Coahuila, Nuevo León, Tamaulipas, Sonora. Approximately, 175 Mexican response personnel completed the course and approximately 114 Mexican completed the second course. Attendees included staff from Federal Attorney General for Environmental Protection (PROFEPA, acronym in Spanish), National Coordination for Civil Protection (CNPC, acronym in Spanish), Mexico's State Civil Protection of Sonora, emergency response personnel from numerous Mexican border cities, industry or maquiladoras, members of the CLAM (Comité Local de Ayuda Mutua, acronym in Spanish). The trainings were funded by EPA's <u>Superfund¹</u> Division through its START² contract.

¹ Superfund is a program administered by the United States Environmental Protection Agency (U.S.EPA) that identifies and cleans sites that have been contaminated by a high level of toxic wastes.

² Technical contractor.

On October 19 – 21, EPA Region 6 Border Staff and Superfund Staff worked with state counterparts at the Texas Commission on Environmental Quality (TCEQ) to organize a virtual English-language HAZWOPER virtual training for U.S. border fire department and law enforcement personnel in New Mexico and Texas. Approximately, 40 response personnel completed the course. The offering was funded by EPA's Superfund Division through its START contract.

To comply with Objective 3 of Goal 4: Improve joint preparedness in response to hazardous environmental emergencies to strengthen response personnel training, between 2021 – September 2023, a total of 13 training activities were carried out in the sister cities along the U.S.-Mexico Border. Some of the trainings were binational and were preceded by the binational field notifications.

As in the case of the drills, in addition to the training carried out in the sister cities, the remaining municipalities along the U.S.-Mexico border, PROFEPA supported 125 training activities (seminars, workshops, talks, etc.) carried out by the national public and private sectors and prior to drills in the field. Like the drills, the State of Tamaulipas delivered about 37% of the total trainings, the largest number delivered in the border region.

Sister City Training in Reynosa, July 2023

Training by the private sector in the border area of the Santa Cruz, Sonora municipality, July 2023

El Paso/Ciudad Juárez Hazardous Materials Grant and Training

The City of El Paso, Texas received funding from the U.S.-Mexico Border Program to improve joint preparedness for response to hazardous environmental emergencies among first responders in the Paso del Norte (El Paso, Texas/Dona Ana County, New Mexico/Ciudad Juárez, Chihuahua) region. Through the project, 104 U.S. and Mexican responders received virtual and hands-on training on the MAGNASEAL Leak Patch kit, which was also acquired through the Border 2020 grant. The MAGNASEAL Leak Patch kit, serves to mitigate chemical leaks from transportation vessels in a more efficient manner than traditional methods. Through this project, emergency responders from the fire departments in El Paso, Ciudad Juárez, Sunland Park, and Ysleta del Sur Pueblo were able to continue to strengthen their relationships and skills to address environmental hazards as they relate to railcar incidences within the region. A video produced from the hands-on training can be found at https://www.youtube.com/watch?v=30mla2BfkpcC

El Paso, Texas and Ciudad Juárez, Chihuahua first responders during training exercise in May 2021

Eagle Pass Train Derailment Exercise

In April 2023, the EPA, Federal Attorney of Environmental Protection (PROFEPA, acronym in Spanish), the National Coordination for Civil Protection (CNPC, acronym in Spanish), along with the City of Eagle Pass, Texas and Piedras Negras, Coahuila hosted a two-day event, attended by 60 binational stakeholders, to build partnership capacity and provide training for emergency responders. The first day included a workshop to learn more about federal, state, and local agency communications and coordination that go into supporting binational emergency response incidents. On the second day a binational tabletop exercise was held to test the local agencies' abilities to respond to a binational incident affecting the communities of Eagle Pass, Texas and Piedras Negras, Coahuila as described in the local Sister-City Joint Contingency Plan. Lastly, EPA Region 6 responders provided local fire personnel training on air quality monitoring, as well as training on rail response provided by Union Pacific and BNSF Railway. Overall, the event included staff from EPA Region 6, EPA Office of Emergency Management, Mexico's Civil Protection (federal, state, and local), PROFEPA, City of Eagle Pass, City of Piedras Negras, Texas Commission on Environmental Quality (TCEQ), BNSF Railway, Union Pacific.

Emergency Response Training to Eagle Pass, Texas and Piedras Negras, Coahuila first responders in April 2023

Additional Border Projects

Mapping the General Urban Heat and Identifying Urban Heat Island Spots in El Paso, Texas

The City of El Paso was selected for the 2020 Urban Heat Island (UHI) Mapping campaign sponsored by the National Oceanic and Atmospheric Administration (NOAA) in collaboration with Climate Adaptation Planning Analytics (CAPA) Strategies. This project was supplemented with U.S.-MX Border Program funding to focus on a community initiative aimed at providing a better understanding of the UHI effect in El Paso. On July 10, 2020, 41 volunteers collected 66,419 temperature and humidity measurements at 6 AM, 3 PM, and 7 PM. This data was used by CAPA Strategies to generate maps depicting heat fluctuations in certain parts of the city throughout that day. A 17.5 degrees maximum differential was found in the study, which reflects the need to address urban heat issues in El Paso. The project team hosted two hybrid workshops with over 50 community members and stakeholders to improve the understanding of the relationship between heat parameters and health interventions. These maps will serve as a tool for city staff for future urban planning decisions. Results from the 2020 Heat Watch campaign can be downloaded at: https://osf.io/fn4t8/. Through this link, the heat map below can be accessed.

Urban heat map of El Paso County, Texas. July 2020

Transboundary Water Conservation Project: Our Water, Our Future

The objective of this project was to promote and encourage a cultural awareness of protecting and conserving drinking water sources of Ciudad Juárez, Chihuahua. This was accomplished through the development of permanent interactive display in the museum, La Rodadora Espacio Interactivo, supported through a partnership with the

Ciudad Juárez Municipal Water and Wastewater Utility (JMAS, acronym in Spanish), and the Secretary of Education of the state of Chihuahua, as well as several outreach activities.

Due to the Coronavirus-19 (COVID-19) pandemic, initial outreach activities towards the schools (teachers and students) and public took place through virtual training and the museum's Facebook page. Through various videos developed for Facebook and other social media platforms and online "live" interactions, the project team reached over 229,966 persons. The project team provided education virtually to over 547 school children and 200 educators from 85 public schools throughout the city. When the museum finally opened to the public, the exhibit was visited by over 49,938 community members.

Current Ongoing Additional Border Projects

Improving Children's Environmental Health in Hidalgo County:

Texas A&M University, School of Public Health received funding to conduct a project to increase knowledge on reducing children's environmental exposure to lead in Hidalgo County, Texas Head Start Centers. The training will be provided to staff personnel and parents of children enrolled in these centers. The lead curriculum will be distributed through a virtual platform to 30 Head Start Center directors, staff, and parents in Hidalgo County; 15 Childcare Centers directors and staff; and 100 Community Health Workers in the Hidalgo area. The curriculum will be certified by the Texas Department of State Health Services (DSHS). In addition to developing an electronic lead curriculum, the project aims to also develop a curriculum on climate change and its adverse effects on minority communities, the environment and overall public health. The development of the climate change educational material will be accomplished using already published resources.

Tohono O'odham Nation Air Quality and Environmental Health State Environmental Justice Community Agreement (SEJCA) project:

The Tohono O'odham Nation will use the State Environmental Justice Cooperative Agreement funding to develop an air quality plan for the Nation. Due to existing elevated asthma and other respiratory issues within the Nation's population, a major component of the plan will reduce dust impacts by prioritizing upgrades on 15 miles of locally tribally controlled dirt roads. In addition, funds will be used to develop educational resources and conduct outreach for planting native vegetation along roadsides to mitigate air pollution. Elders will lead sessions that combine related air quality topics with traditional ecological knowledge while Tohono O'odham youth will be recruited to monitor, assess, and work within their communities and families to further develop local aspects of the air quality plan.

Air and Health Surveillance System, Mexicali-Imperial Valley:

This project supports <u>REDSPIRA</u>, the Secretaria de Salud (Health State agency in Mexico) and other on-theground partners to do a GIS-based analysis of existing sensor and monitoring particulate matter (PM2.5) data, population information and health data from medical facilities in Mexicali/Imperial Valley to determine the relative vulnerability of the population and use information to guide the development of a public health outreach campaign for nearby communities.