Waste Without Walls: Why Policy, Not Infrastructure, Must Fix Tijuana River Pollution

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Introduction and History

A century-old problem remains unsolved as untreated sewage and industrial waste continues to flow from the Tijuana River into San Diego's Imperial Beach and the Pacific Ocean. Despite decades of binational treaties, agency involvement, and millions of dollars invested in cross-border wastewater management, the crisis persists. Understanding why requires examining not only the infrastructure failures, but the economic forces accelerating population growth and industrial development in Tijuana without paralleled investment in basic sanitation.

The U.S.-Mexico Water Treaty of 1944 established the International Boundary and Water Commission (IBWC) to address transboundary water issues and ensure cooperation on pollution between the United States and Mexico.[1] The La Paz Agreement of 1983 expanded on the 1944 Treaty framework and created the Border Environment Cooperation Commission (BECC) to promote joint monitoring and pollution reductions for air, water and solids waste along the border.[2] These agreements led to the construction of the South Bay International Wastewater Treatment Plant (SBIWTP), completed in 1996 on a 75-acre site immediately north of the City of Tijuana.[3] The

[1] "About Us," International Boundary and Water Commission, accessed December 7, 2025, About Us - IBWC
[2] "La Paz Agreement," U.S. Environmental Protection Agency, accessed November 7, 2025, LaPaz Agreement
[3] "International Wastewater Treatment Plants," California Regional Water Quality Control Board International Wastewater Treatment Plant | San Diego Regional Water Quality Control Board

SCIWTP is designed to receive and further treat wastewater originating from Tijuana wastewater and is permitted to discharge 25 million gallons per day (MGD) into the Tijuana River Estuarine Reserve before flowing into the Pacific Ocean.[5]

However, the plant consistently violates permit discharge limits due to chronic underfunding, aging equipment and flows that exceed design capacity.[5] As a result of these failures, the California Regional Water Quality Control Board issued a Cease-and-Desist Order in May 2021 requiring the SBIWTP to make the necessary major repairs and operational upgrades.[4] South of the border, the Punta Bandera Wastewater Treatment Plant, built in 1976 approximately six miles south of the U.S.-Mexico border, has suffered similar challenges, frequently operating below capacity or failing outright.[3] Despite the 2000 Tijuana River Valley Estuary and Beach Sewage Cleanup Act (H.R. 3378) authorizing coordinated cleanup action, the fundamental conditions causing pollution have not changed.[4]

Meanwhile, residents on both sides of the border continue to endure severe public health impacts including noxious odors and toxic gases. The University of California San Diego Scripps Institute of Oceanography has monitored hydrogen sulfide (H_2S) levels in the Tijuana Reserve with average H_2S concentrations upwards of 2,100 ppb/hr., which far exceeds the California Office of Environmental Health Hazard Assessment standard of 7.3 ppb/hr.[5] These levels pose immediate health risks,

[4] "U.S. Congress, House. Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000, House Report 106-842, 106th Cong., 2nd sess., September 18, 2000, H. Rept. 106-842 - TIJUANA RIVER VALLEY ESTUARY AND BEACH SEWAGE CLEANUP ACT OF 2000 | Congress.gov | Library of Congress

[5] Alex Fox, "Tijuana River's Toxic Water Pollutes the Air" UC San Diego Today, August 28, 2025, Tijuana River's Toxic Water Pollutes the Air

contribute to chronic respiratory illness, and drive repeated beach closures in Imperial Beach.[5] For decades, the national focus has been on end-of-pipe solutions: building or repairing centralized wastewater treatment plants once flows from Tijuana reach the U.S. border.[6] But given the scale of population growth and industrial expansion, this approach is no longer sufficient.

This blog asserts that the Tijuana River's transboundary pollution crisis cannot be resolved by simply expanding treatment capacity. A sustainable and environmentally just solution requires coordinated U.S.-Mexico policy reforms that hold U.S. industries relocating to Mexico financially responsible for investing in modern community infrastructure and upstream waste-management.

[6] "Wastewater Treatment Plants," International Boundary and Water Commission Wastewater Treatment Plants - IBWC

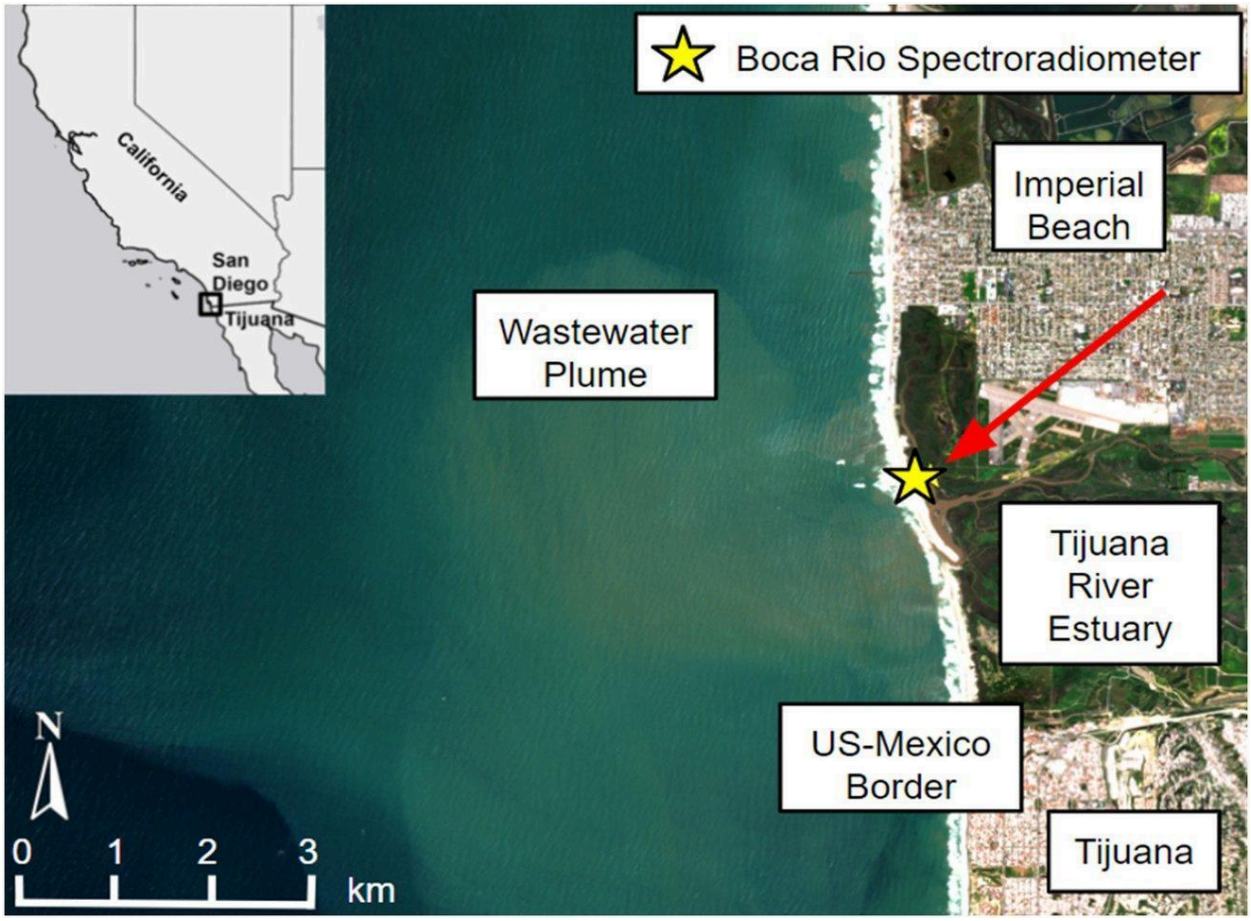

Figure 1. A raw sewage plume has been leaking from the Tijuana River Estuary and extending nearly three miles into the ocean, resulting in the closure of Imperial Beach to the public for 1,300 straight days since December 2021. (NASA 2025)

Environmental Justice Across the Border

The Tijuana River pollution crisis is fundamentally an environmental justice issue affecting marginalized communities in both nations.[7] In Tijuana, many workers employed at U.S.-owned manufacturing plants (maquiladoras) live in dense, rapidly constructed communities (colonias) on steep hillsides where municipal sewer service has never been constructed.[8] These neighborhoods lack paved roads, drainage infrastructure, or safe sanitation facilities.[8] As informal settlements expand faster than the city can build utilities, residents become disproportionately exposed to raw sewage, contaminated runoff, and industrial waste discharges.[8]

On the U.S. side, Imperial Beach, one of California's lowest-income coastal communities, bears the brunt of the transboundary pollution.[7] Chromic sewage flows force beach closures for hundreds of days each year, degrade air quality, and disrupt local business dependent on tourism.[8] While the pollution continues to cross the border easily, authority, resources and political power does not.

[7] Sarah Bardeen, Poor Water Quality and Noxious Smells are a Cross-Border Headache on the Tijuana River, October 29, 2025, Poor Water Quality and Noxious Smells Are a Cross-Border Headache on the Tijuana River - Public Policy Institute of California

[8] Phillip Musegaas, Understanding the Tijuana River Sewage Crisis-An Overview of Causes and Consequences, May 2, 2024, Understanding the Tijuana River Sewage Crisis – An Overview of Causes and Consequences | San Diego Coastkeeper

Figure 2: County of San Diego beach closure sign due to sewage contamination at Imperial Beach. (NASA 2025)

The communities experiencing environmental harms do not have the ability to influence regional planning, shape industrial development, or enforce environmental laws. Any sustainable long-term solution must therefore incorporate environmental justice principles by strengthening upstream sanitation access, addressing industrial pollution at the source, and ensuring those who are profiting from the industry at issue contribute to community infrastructure.

Analysis: Infrastructure Cannot Keep Up with Industrial Growth

Tijuana's wastewater treatment capacity is not sufficient to manage current waste volumes, let alone the projected growth driven by nearshoring. Economic data show that U.S. companies relocating manufacturing to Mexico increased by 18% in recent years, with nearly 62% of American companies considering moving production to Mexico for tariff advantages, proximity to U.S. markets and lower labor costs.[9] This industrial expansion creates jobs but also accelerates population growth in areas with limited infrastructure which already cannot support Tijuana's current population of 2 million residents.[10]

Expanding centralized sewer and wastewater system throughout the rapidly urbanized landscape around Tijuana is logistically challenging and financially prohibitive.[11] Long-term solutions must address the root cause of the problem, unplanned growth around industrial corridors, lack of community infrastructure, insufficient pretreatment, or absence of localized sanitation systems.[11]

[9] "American Companies Moving Their Production to Mexico," American Industries Group, US Companies Moving to Mexico for Manufacturing
[10] "Tijuana, Mexico Population 2025," World Population Review, Tijuana Population 2025
[11] "The Bajagua Project: Finding a Solution to the San Diego-Tijuana Border Sewage Crisis," SciSpace, 2004, The Bajagua Project: Finding a Solution to the San Diego-Tijuana Sewage Crisis

Proposed Solutions

One promising solution is creating community sanitation hubs using the SEMiLLA sanitation units. Developed by Dutch scientists, this technology has been used for humanitarian contexts in India and Brazil, as well as at eco-focused music festivals.[12] These hubs can provide sanitation services, significantly reducing the volume of untreated sewage entering the Tijuana River. They can also create local jobs, support community resilience, and reduce reliance on end-of-pipe wastewater treatment at the border.[13]

These small, decentralized centers combine:

- Local wastewater treatment systems
- Composting toilets
- Education facilities and vocational training centers
- Water kiosks with clean drinking water

[12] "Philanthropy for Climate: Case Studies," March 2023, PhilanthropyForClimate-CASE-STUDIES-Full-document-April-2023.pdf

[13] "Basic Necessities for Life," SEMiLLA Sanitation Hubs, www.semillasanitationhubs.com | Basic necessities for life

Figure 3: SEMiLLA Sanitation Hubs are closed wastewater treatment units that promote good hygiene with toilets, washing, and showering facilities.

Implementation could be funded through pollution-related taxes on incoming U.S. industries, ensuring sectors contributing to population growth and waste generation also invest directly to community-level infrastructure. As funding is secured, government agencies could establish dedicated planning and construction teams to identify priority locations that would best benefit the surrounding community.

Polluter-Pays: U.S. Industry Must Help Fund Wastewater Solutions

A central driver of Tijuana expansion is rapid relocation of U.S. owned maquiladoras that rely on low labor costs, reduced tariffs and geographic proximity to the U.S. compared to China.[9] While these companies enjoy substantial economic benefits, they do not proportionally contribute to the environmental impacts they cause, such as

wastewater runoff, nor do they provide the infrastructure needed to support the communities housing their workers.

This dynamic pushes environmental and public health costs onto the Mexican government and border communities, which lack regulatory capacity and financial resources to keep up with the industrial growth. Mexico does have some existing regulatory framework, managed by the *Sectretaria de Medio Ambiente y Recursos Naturales* (SEMANART) and *Comisión Nacional del Agua* (CONAGUA), which establishes broad environmental obligations, but does not seem to require foreign-owned industries to invest into the communities.[14]

To address this inequality, Mexico could expand its polluter-pays mechanism to model the US's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or other similar U.S. requirements.[15] For example, under the California Environmental Quality Act (CEQA), major industrial projects must conduct Environmental Impact Reports (EIRs) and provide mitigation for local impacts.[16] In the Wilmington area of Los Angeles, refineries in historically redlined communities have

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[14] "Conagua: Towards an Integrated and Sustainable Management of Water" Secretaria de Madio Ambiente y Recursos Naturales CONAGUA, hacia una gestión integrada y sustentable del agua | Secretaría de Medio Ambiente y Recursos Naturales | Gobierno | gob.mx, The SEMANART department is the broad federal environmental policy and regulation of Mexico. CONAGUA is the National Water Commission which focuses on federal water resource management.

[15] "Comprehensive Environemtnal Response, Compensation, and Liability Act (CERCLA) and Federal Facilities," U.S. Environemtnal Protection Agency, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Federal Facilities | US EPA

[16] California Environmental Quality Act (CEQA)," Office of the Attorney General, State of Californai, California Environmental Quality Act (CEQA) | State of California - Department of Justice - Office of the Attorney General

been required to invest in community parks, school modernization and health protections.[17]

A similar system in Mexico could require maquiladoras relocating to Tijuana regions to pay environmental impact fees or contribute a percentage of their capital investment toward community-scale wastewater treatment systems, pretreatment infrastructure, vocational training, water quality monitoring and educational programs. Such policies would not only strengthen environmental protection but also ensure industries benefitting from Mexico's economic advantages are contributing to sustainable, long-term development. This approach aligns with Title 3 of Mexico's Regulations of the Law of National Waters (Reglamento de la Ley de Aguas Nacionales), which directs the Mexican government to secure financing mechanisms for watershed conservation, infrastructure improvement and ecological restoration.[18] An industry-focused impact fee could help make these mandates operational in targeted and equitable ways.

Mexico already has a regulatory framework to address industrial pollution in included in their Regulation of the General Law of Ecological Balance and Environmental Protection in Matters of Ecological Planning (Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Evaluación del Impacto Ambiental) or LGEEPA.[19] Under Chapter III, Article Nine, the law requires industries to conduct

[17] Eenvisioning a Greener LA," UCLA Labor Center, 2014, 2014-Community-Scholars_Envisioning-a-Greener-LA.pdf
[18] Mexico. Reglamento de la Ley de Aguas Nacionales. Diario Oficial de la Federación (DOF), August 25, 2014, Orden Jurídico Nacional
[19] Mexico. Reglamento de la Ley General de Equilibrio Ecológico y Protección al Ambiente en Materia de Evaluación del Impacto Ambiental, Diario official de la Federación (DOF), October 31, 2014, Orden Jurídico Nacional

EIAs and report emissions and discharges.[18] While the LGEEPA regulations emphasize reporting and audits rather than pollution fees or penalties, enforcement gaps have limited their effectiveness. Mexico's environmental enforcement is weakened by understaffed agencies responsible for large geographic areas, infrequent inspections and low penalties that fail to deter violations, and fragmented governance that diffuses authority and hinders consistent oversight.[20] By implementing strict fines or royalties on incoming U.S. maquiladoras, Mexico could leverage its existing LGEEPA framework to designate ecological-planning zones where industries must contribute to social and environmental infrastructure that would benefit the Mexican communities. On the U.S. side, EPA and the International Boundary and Water Commission could coordinate funding to complement these efforts, supporting Mexican enforcement agencies that can lack resources. Together, the binational approach could transform chronic transboundary pollution into a shared responsibility, promote environmental justice and uphold the principle that those who generate pollution must help pay for infrastructure required to manage it.

Conclusion

The Tijuana River pollution crisis is not simply a wastewater treatment issue, it is the result of decades of structural inequalities, underinvestment, and rapid industrial expansion unable to keep up with economic change. While building a new wastewater

[20] "PROFEPA 2024," Redes Quinto Poder, March 25, 2024, PROFEPA Sin personal para inspeccionar industria contaminante en Nuevo León - Redes Quinto Poder IDEA, PROFEPA stands for Procuraduría Federal de Protección al Ambiente which translates to Federal Attorney for Environmental Protection. This is Mexico's environmental enforcement agency that operates under SEMARNAT.

treatment plant or upgrading existing ones is necessary, these actions alone will not address the root causes of contamination.

A sustainable solution requires shifting from emergency response to proactive planning. This means integrating environmental justice initiatives into development decisions, decentralizing sanitation infrastructure and expanding the polluter-pays model so U.S. industries are required to contribute to the communities that power their success. By aligning industrial policy, community development and environmental management, Mexico can protect human health, restore the Tijuana River watershed and build a more resilient future for both sides of the border.