



# Addressing Environmental Challenges on the U.S.-Mexico Border

2024 WRRC Conference, University of Arizona, Tucson, Arizona  
March 13, 2024



## Established in 1994

## Mandate

Develop and finance environmental infrastructure along the U.S.-Mexico border to improve well-being of the population:

- Projects located within 100 km north and 300 km south of the border
- Provide loans and grants for their implementation
- Offer technical assistance for project development

## Structure

Owned and governed equally by the Governments of the United States and Mexico

## Offices

San Antonio, TX and Ciudad Juarez, CHIH

## Ratings

Aa1 – Moody's; AA+ – Fitch

# Governance

## Board of Directors

- ◆ NADBank has a ten-member, binational Board of Directors, with an equal number of representatives from each country.

U.S. Members	Mexico Members
<i>Secretary of the Treasury</i>	<i>Secretary of Finance and Public Credit (SHCP)</i>
<i>Secretary of State</i>	<i>Secretary of Foreign Affairs (SRE)</i>
<i>Administrator of the Environmental Protection Agency</i>	<i>Secretary of the Environment and Natural Resources (SEMARNAT)</i>
<i>U.S. Border State Representative</i>	<i>Mexican Border State Representative</i>
<i>U.S. Border Public Representative</i>	<i>Mexican Border Public Representative</i>



# Jurisdiction

## U.S.- Mexico Border Region

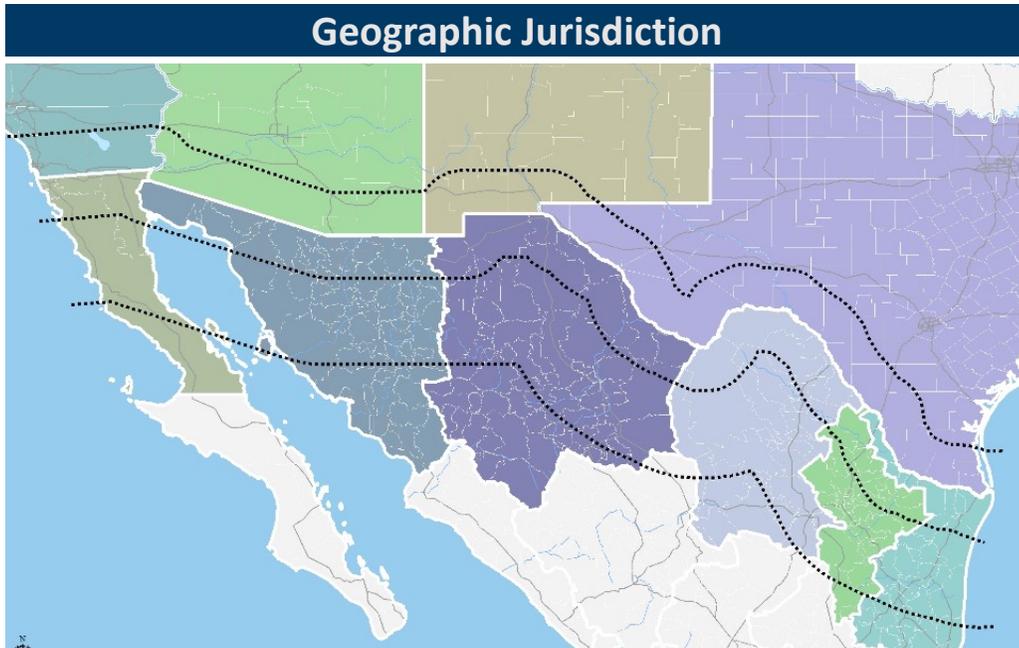
◆ Eligible projects must be located within **100 km north** and **300 km south** of the U.S.-Mexico border

### ◆ U.S. Border

- 41 counties in four states
- Population: 6.34 million (2.05% of U.S. population)

### ◆ Mexican Border

- 220 municipalities in six states
- Population: 16.41 million (14.61% of Mexican population)



Population within Jurisdiction	
United States	
State	Population
Arizona	912,519
California	3,197,461
New Mexico	179,579
Texas	2,049,360
<b>Total</b>	<b>6,338,919</b>
Mexico	
State	Population
Baja California	3,151,135
Chihuahua	2,974,318
Coahuila	1,774,565
Nuevo León	4,614,869
Sonora	1,646,690
Tamaulipas	2,248,745
<b>Total</b>	<b>16,410,322</b>

# Eligible Sectors

## Project Types



### WATER

- » Drinking
- » Wastewater
- » Conservation
- » Reuse+Augmentation
- » Stormwater



### SOLID WASTE

- » Municipal
- » Industrial
- » Recycling



### AIR QUALITY

- » Mobility
- » Paving
- » Border crossings
- » Industrial emissions



### SUSTAINABLE ENERGY

- » Generation
- » Storage
- » Efficient use



### SUSTAINABLE CITIES

- » Urban development
- » Sustainable buildings
- » Industrial parks



### SUSTAINABLE PRODUCTION

- » Green manufacturing and products
- » Food value chains



### CLIMATE CHANGE

- » Mitigation
- » Adaptation

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# Ensenada Desalination Plant: Water Augmentation Case Study

# Ensenada, Baja California



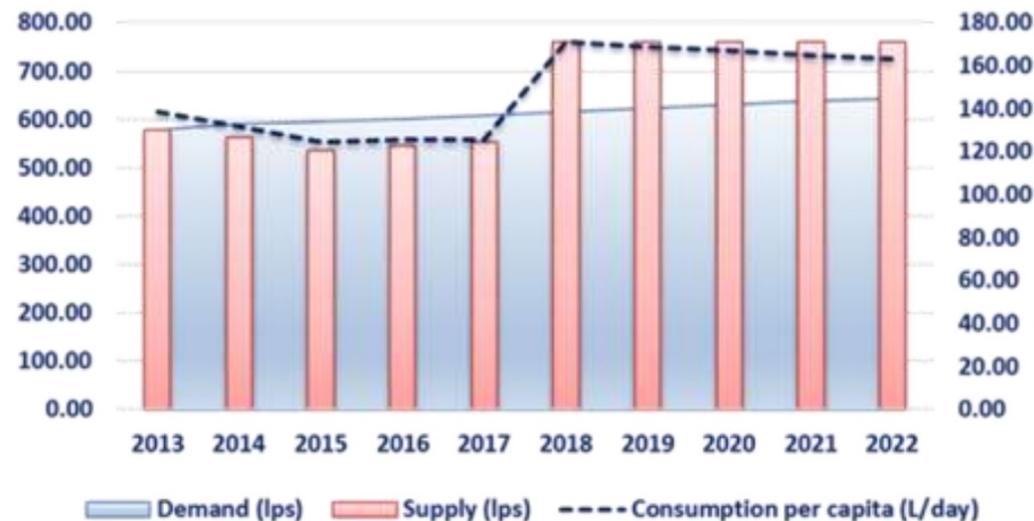
- ◆ Ensenada is located 110 km (75 mi) south of the US-Mexico border.
- ◆ It is the largest municipality in Mexico.
- ◆ 3rd largest city in the State of Baja California with current population of 443,000, but expected to grow to 534,000 over the next 20 years (CAGR ~ 0.93%). Represents approximately 12.4% of Baja California State population.
- ◆ Main economic activities: port services, tourism and wine industry.
- ◆ The city is located in a semi-arid region that has experienced the worst drought in Mexico in the recent years. Due to climate change and with an expected 30% reduction in rainfall, this condition is just expected to worsen.
- ◆ NADBank estimates that energy efficiency is greater by desalinating in Ensenada rather than bringing water from the Colorado River (3.43 kwh/m<sup>3</sup> vs 4.5 kwh/m<sup>3</sup>) thus contributing to less generation of Green House Gas emissions.

# Water demand and supply



Aquifer	Status as of 1996	Deficit (Mm3/year)
Ensenada	overexploited	-6.635775
Manadero	equilibrium	17.669958
La Misión	overexploited	-2.082832
Guadalupe	overexploited	-12.045470

- ◆ Currently, Ensenada does not have sufficient water sources, and those that could be exploited, are not adequate for human consumption.
- ◆ CESPE has been receiving temporarily water from the Colorado River Aqueduct.
- ◆ Mexican Standard for drinking water is set by NOM-127-SSA1-1994 which sets a maximum level on Total Dissolved Solids (TDS) of 1,000 ppm. Because of saline intrusion, TDS in overexploited aquifers are above 3,000 ppm.
- ◆ With the desalination plant in operation water supply in 2018 will total 760 lps. At current water consumption levels, this source will meet the city's demand requirement until 2037.

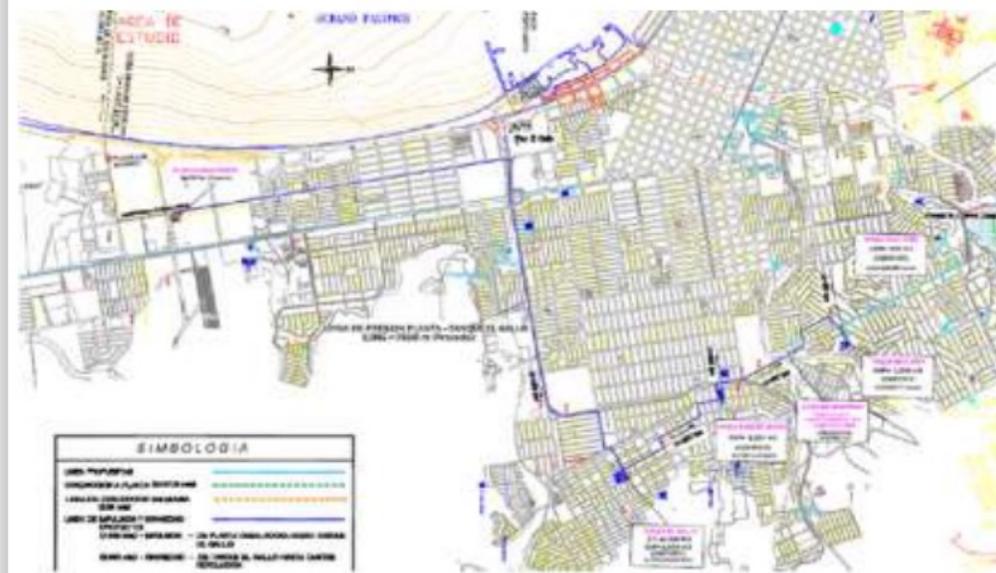


# The Desalination Plant Project

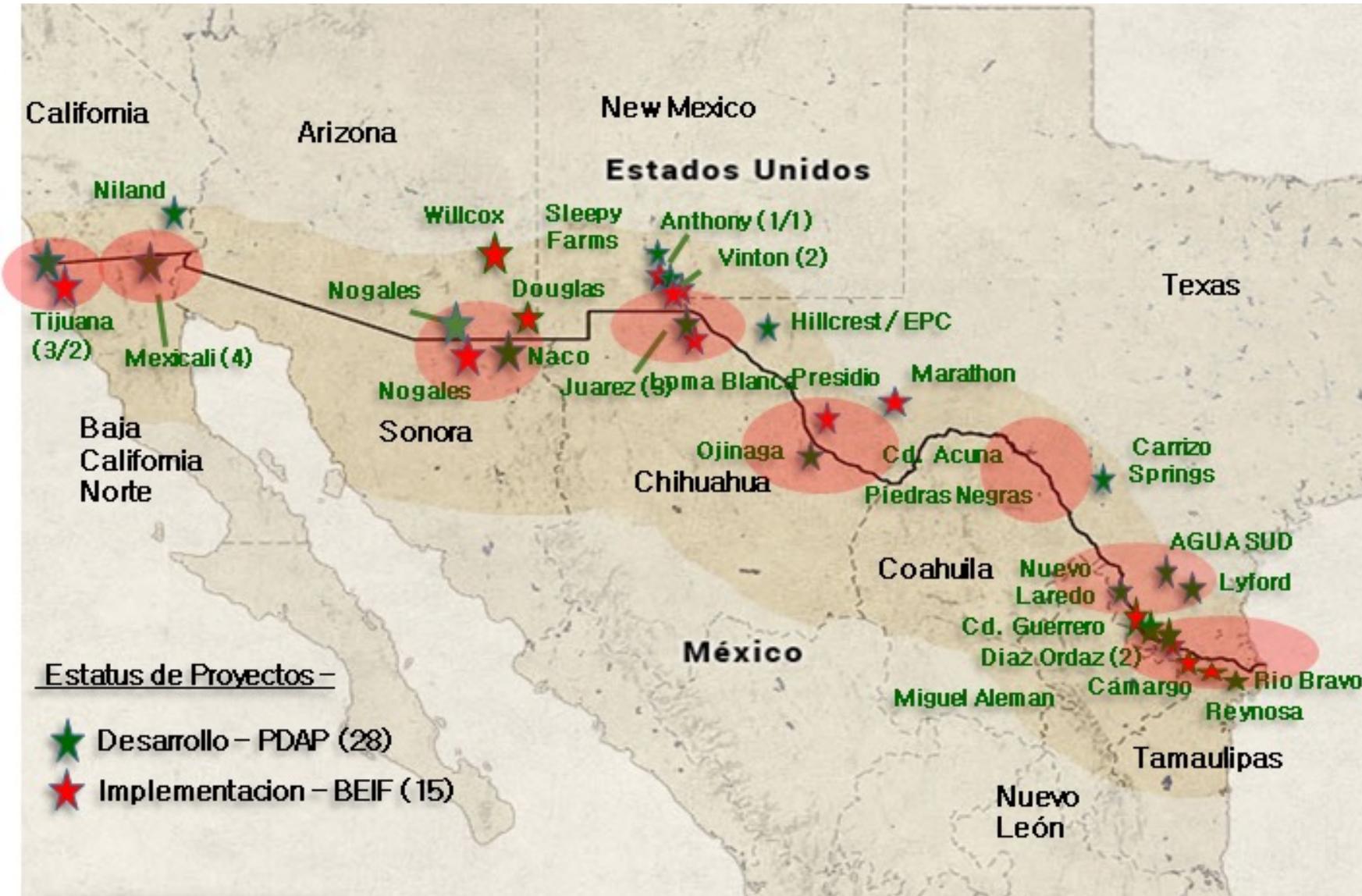


Project scope includes design, construction and operation of a desalination plant that will provide 250 lps (5.7 mgd) of drinking water which includes:

- Direct offshore seawater intake
- Pretreatment, pump station and water main
- A reverse osmosis seawater treatment plant
- Post treatment facilities
- Conveyance system to discharge brine into the ocean
- Storage tank, pump stations and conveyance lines to connect to Ensenada's drinking water system
- Ancillary civil works (buildings, roads, etc.)



# NADBANK's Project Piepline + Hot Spots

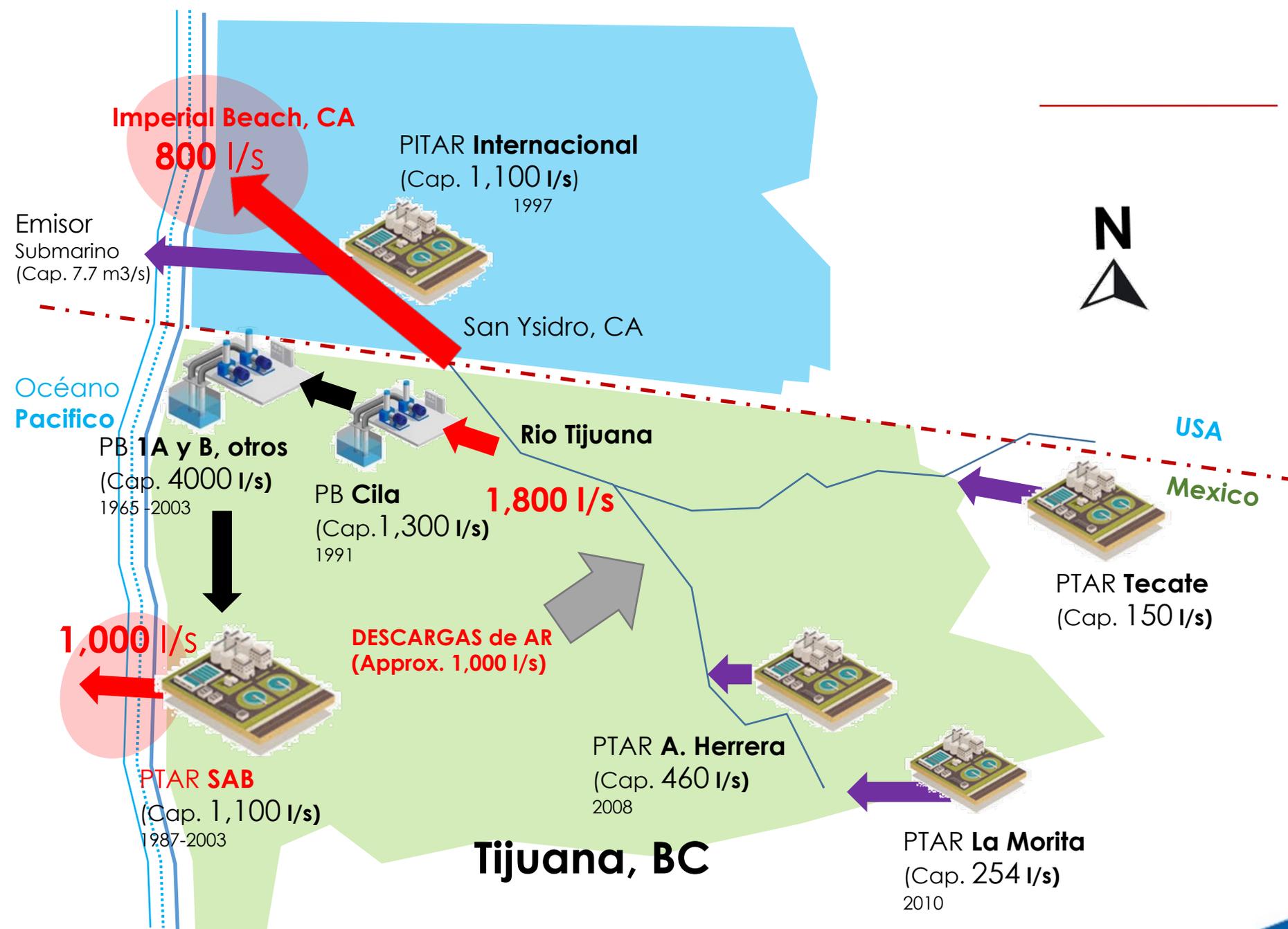


## West Region 9

- Tijuana, BC
- Mexicali, BC
- Nogales/ Naco, SON

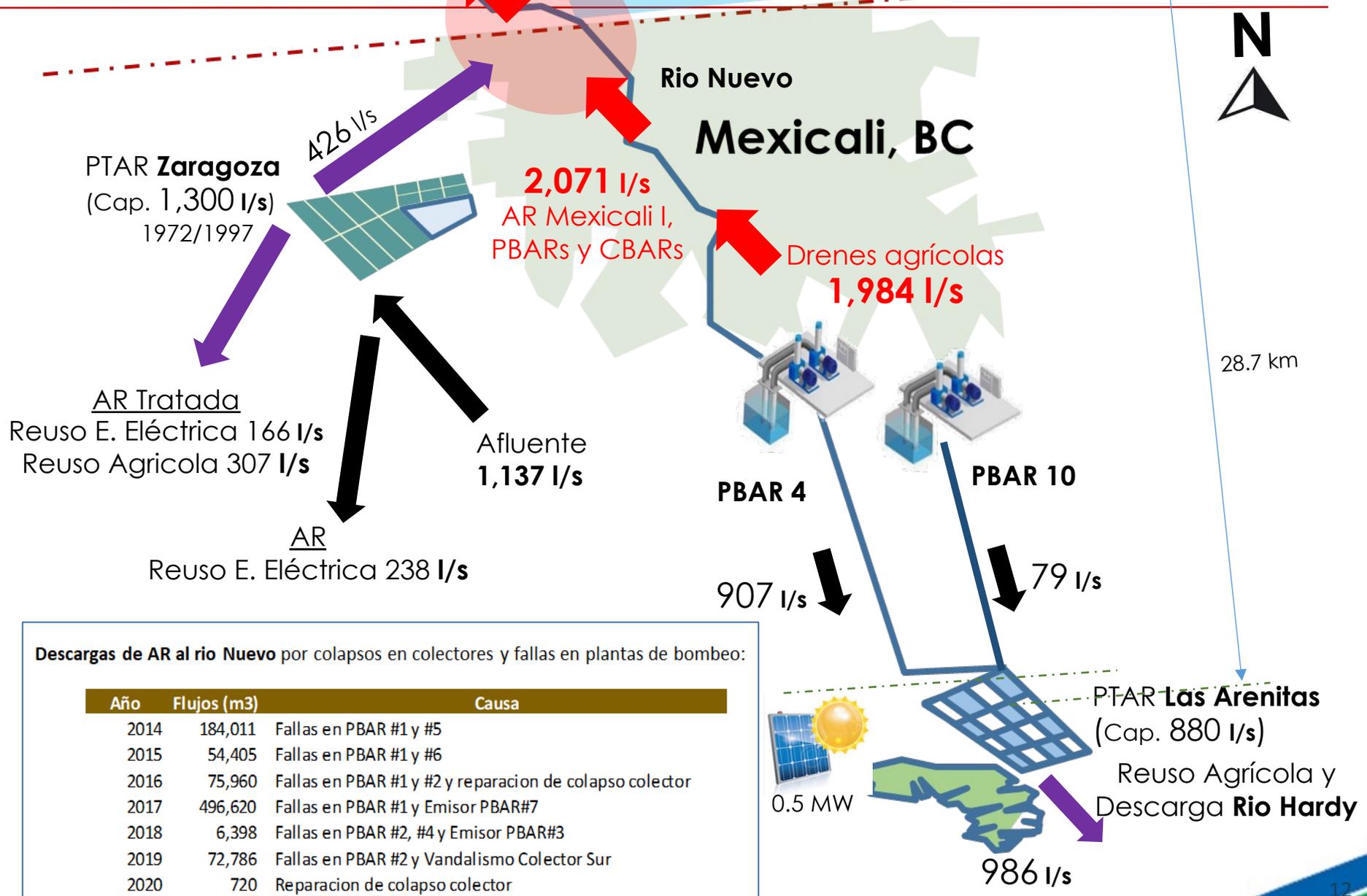
## East Region 6

- Cd. Juarez, CHIH
- Ojinaga, CHIH
- Cd. Acuna/Piedras Negras, COAH
- Nuevo Laredo, TAMPS
- Nueva Cd. Guerrero, TAMPS.
- Diaz Ordaz, TAMPS
- Camargo, TAMPS
- Reynosa, TAMPS



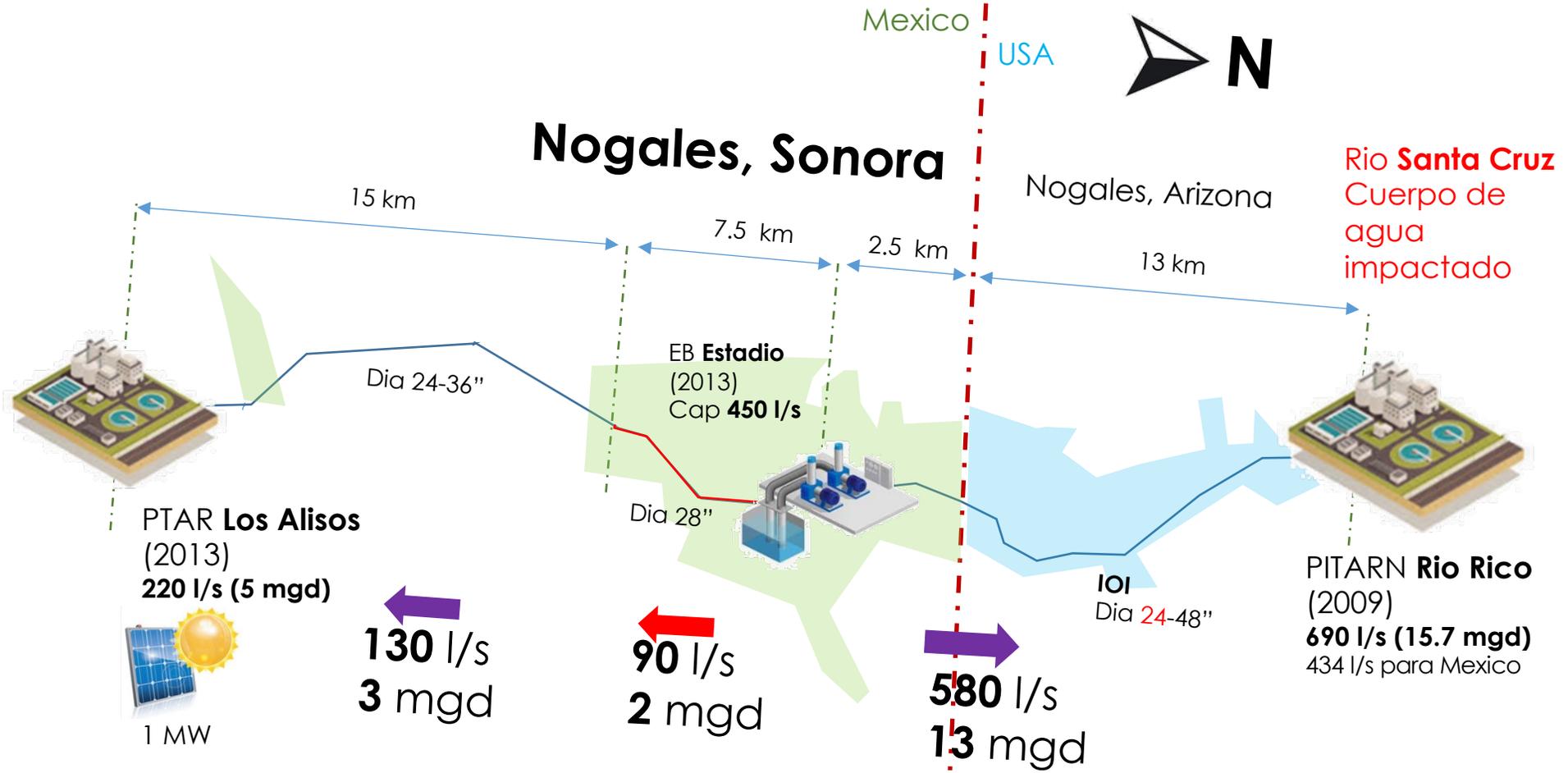
**New River**  
y Mar del Salton  
(Cuerpos de agua impactados)

**4,055 I/s**  
Calexico, CA



**Descargas de AR al rio Nuevo por colapsos en colectores y fallas en plantas de bombeo:**

Año	Flujos (m3)	Causa
2014	184,011	Fallas en PBAR #1 y #5
2015	54,405	Fallas en PBAR #1 y #6
2016	75,960	Fallas en PBAR #1 y #2 y reparacion de colapso colector
2017	496,620	Fallas en PBAR #1 y Emisor PBAR#7
2018	6,398	Fallas en PBAR #2, #4 y Emisor PBAR#3
2019	72,786	Fallas en PBAR #2 y Vandalismo Colector Sur
2020	720	Reparacion de colapso colector



Año	Poblacion	Dotacion		Aguas Residuales (80%)	Flujos de AR Tratados (L/s)		
		lhd	L/s	L/s	Los Alisos	Acta 276	Exceso
2020	264,879	327	1,002	802	220	434	148
2030	310,445	327	1,175	940	440	434	66
2040	363,849	327	1,377	1,102	440	434	228

Nota: Se asume que la dotacion se mantiene constante y que se construye la ampliacion a Los Alisos

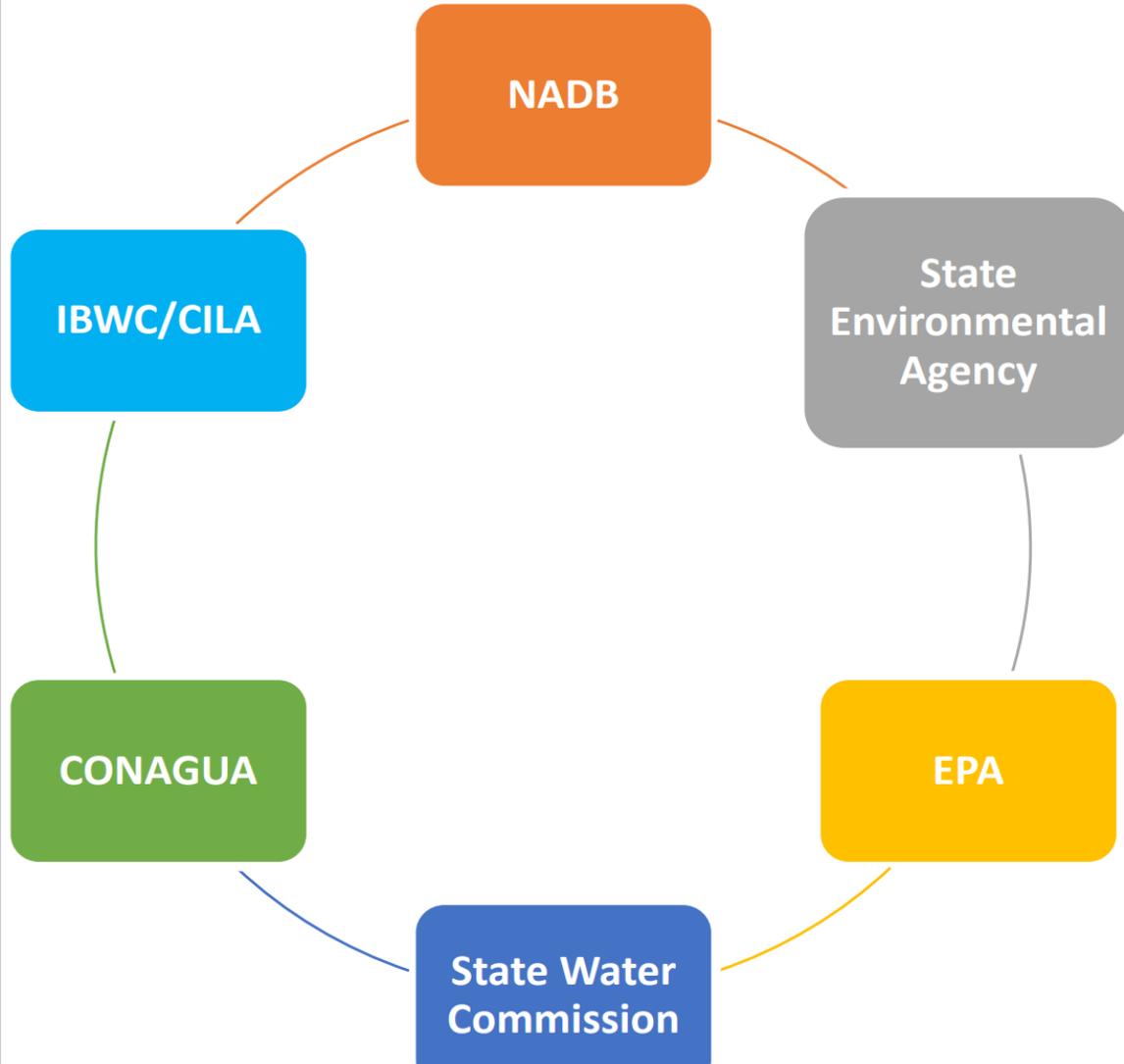
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## **Naco WW Discharges: Wastewater discharges Case Study (Reuse?)**

# Collaborative Efforts in the Border Region



## Collaborating Agencies



## Border Env. Infra. Fund (BEIF)

- ◆ Administer EPA funds of more than US\$700 million, 136 projects; 69 in US & 67 in Mexico

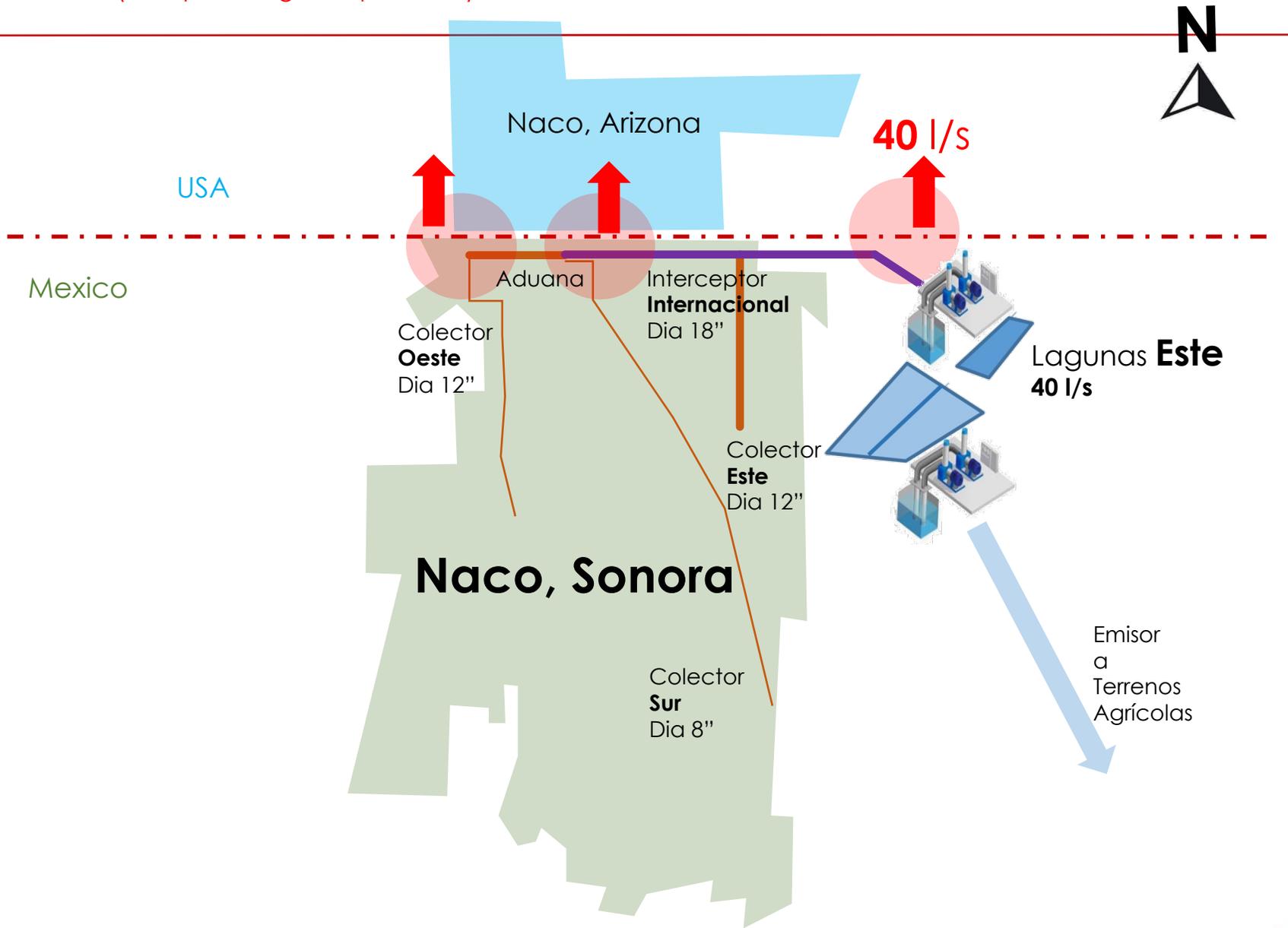
## AZ Dept. of Env. Quality

- ◆ Worked with communities and agencies along the AZ-SON border to mitigate and permanently eliminate transboundary spills.

## TX Commission on Env. Quality

- ◆ Manage a binational fund aimed at improving air quality monitoring capabilities in the Paso del Norte air basin.

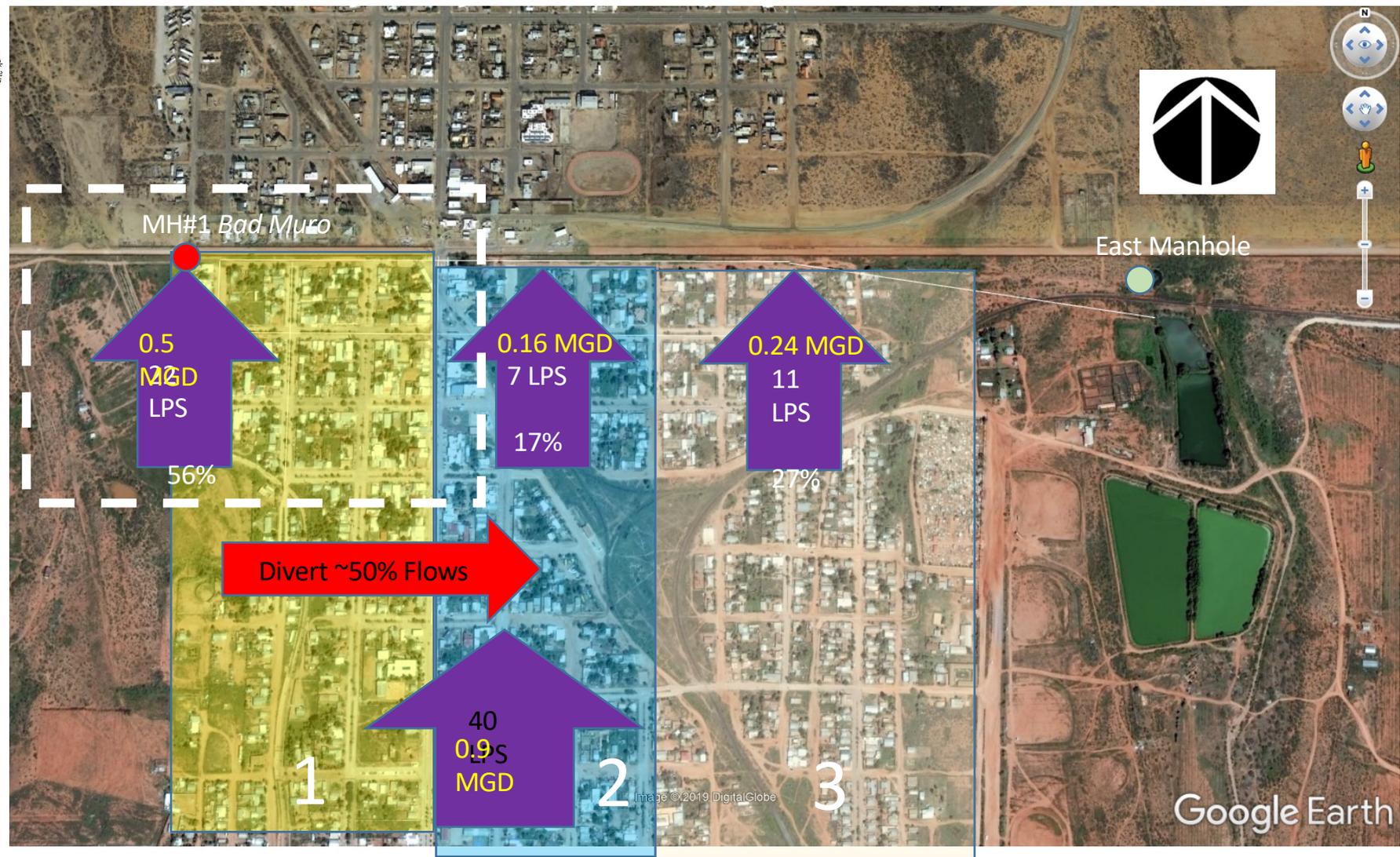
# Rio San Pedro (Cuerpo de agua impactado)



# SN Naco (WWC & WWTP) TB flows



NACO  
WW  
FLOWS

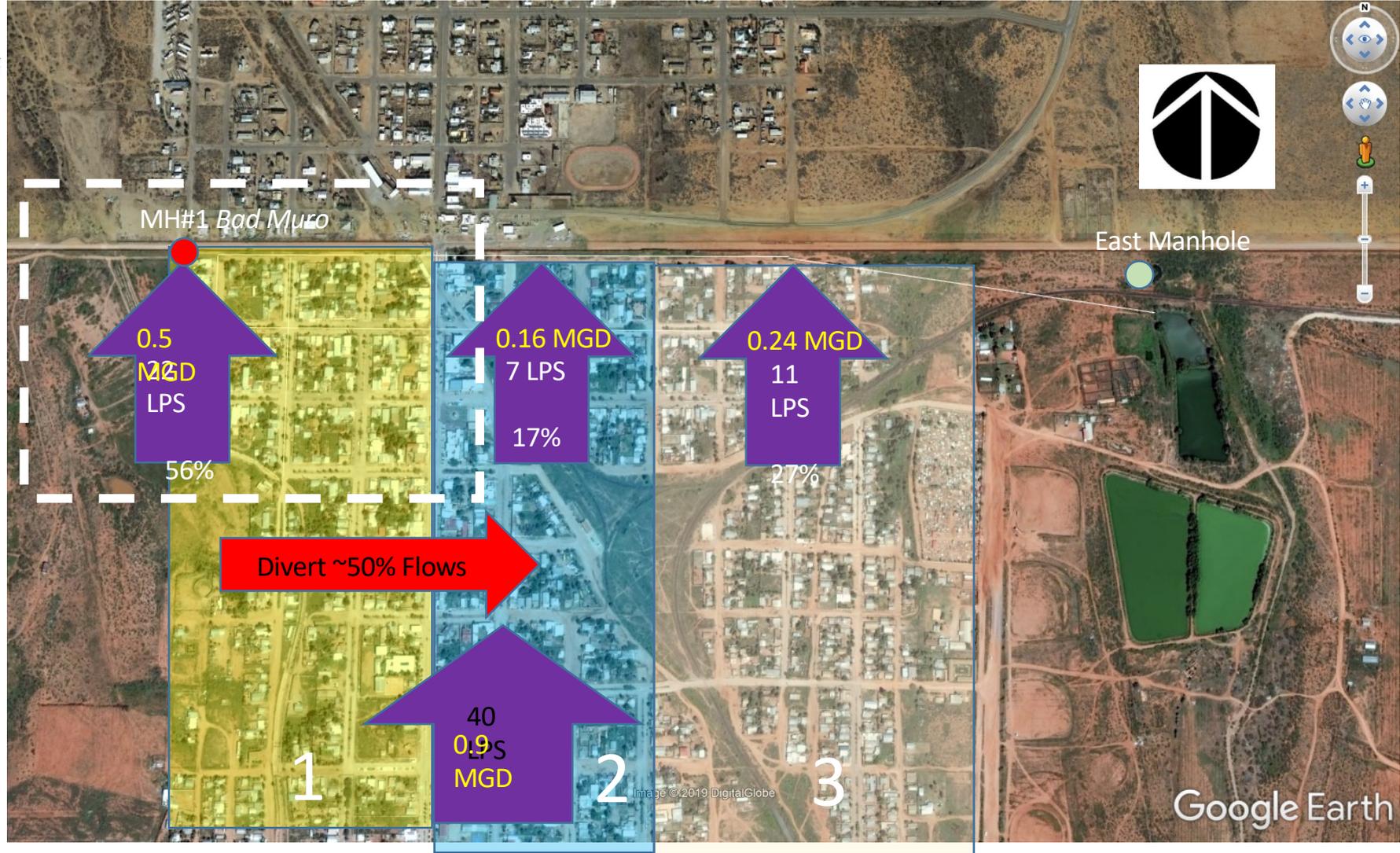


Google Earth

# SN Naco (WWC & WWTP) TB flows



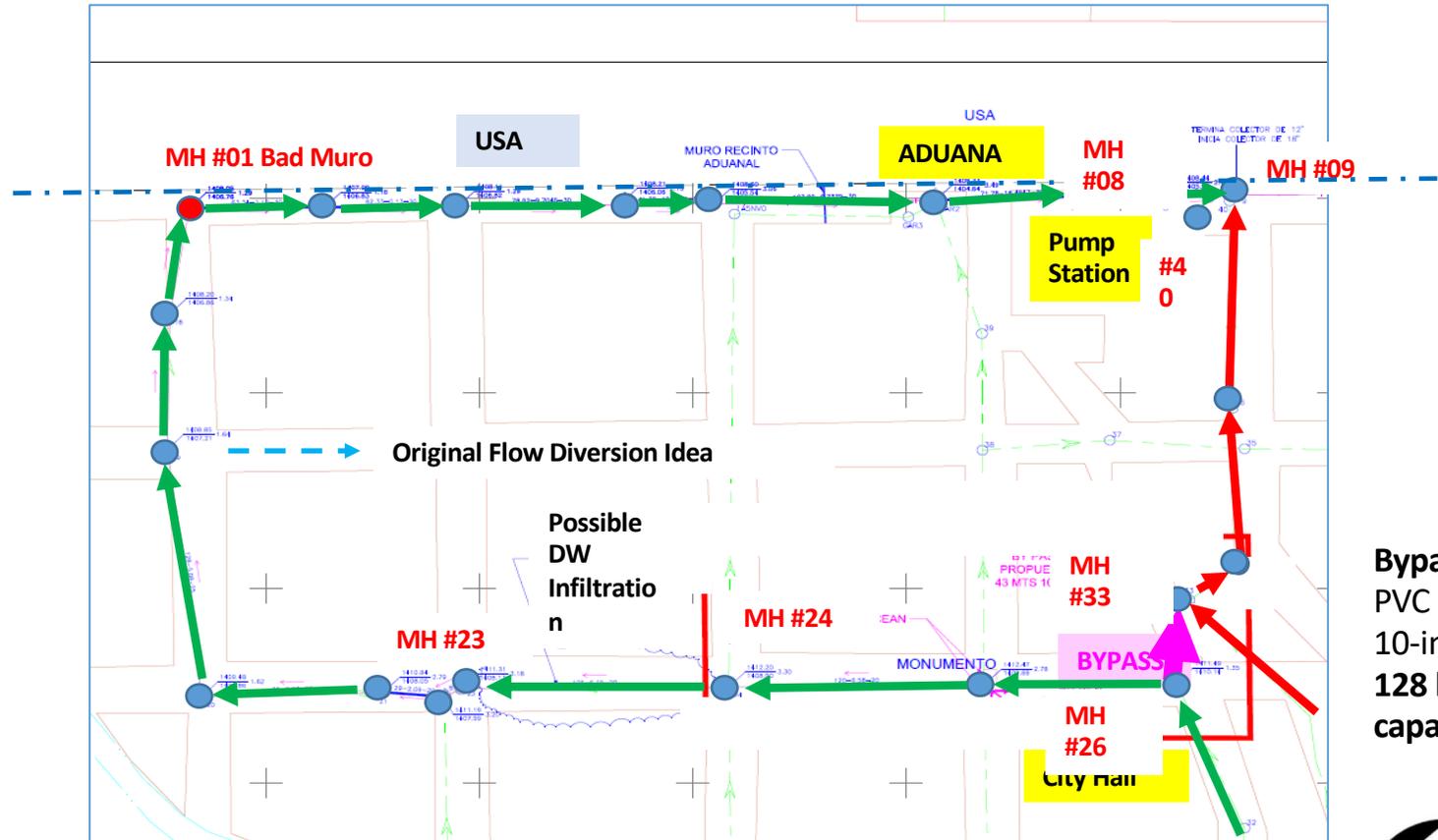
NACO  
WW  
FLOWS



# SN Naco (WWC & WWTP) TB flows



## North West WWC Area Interceptor Bypass



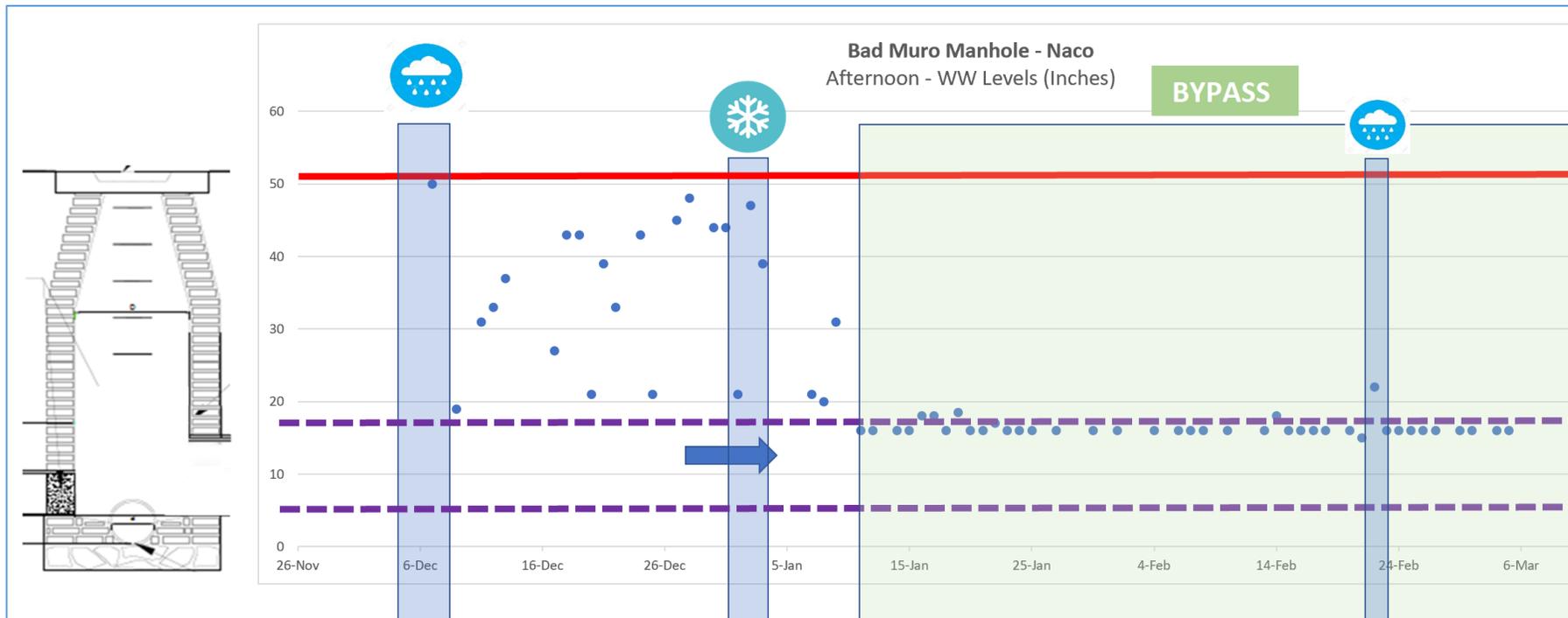
**Bypass Data**  
PVC Clase 20  
10-inch  
128 lps  
capacity



# SN Naco (WWC & WWTP) TB flows



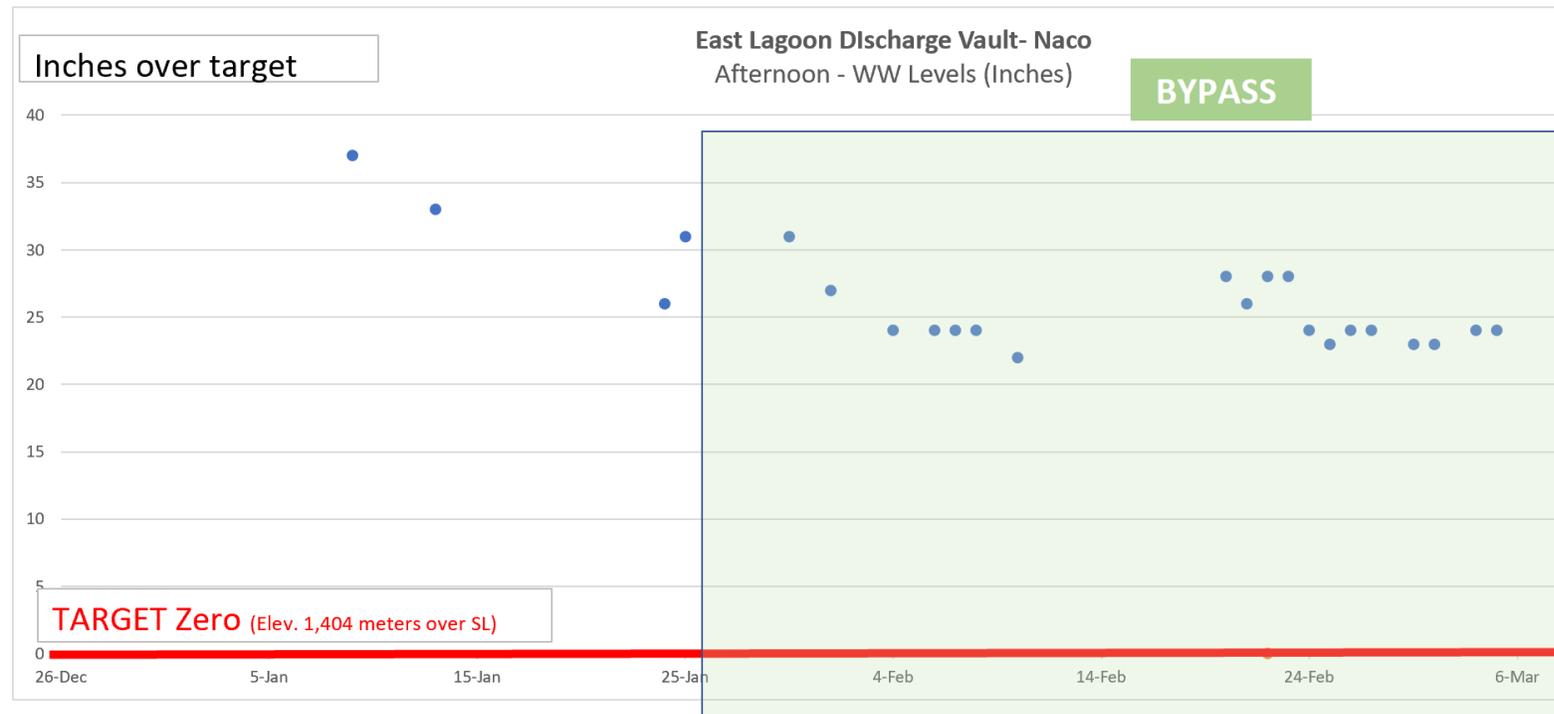
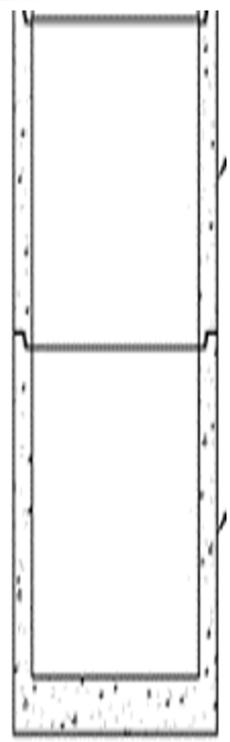
Status March 5, 2019



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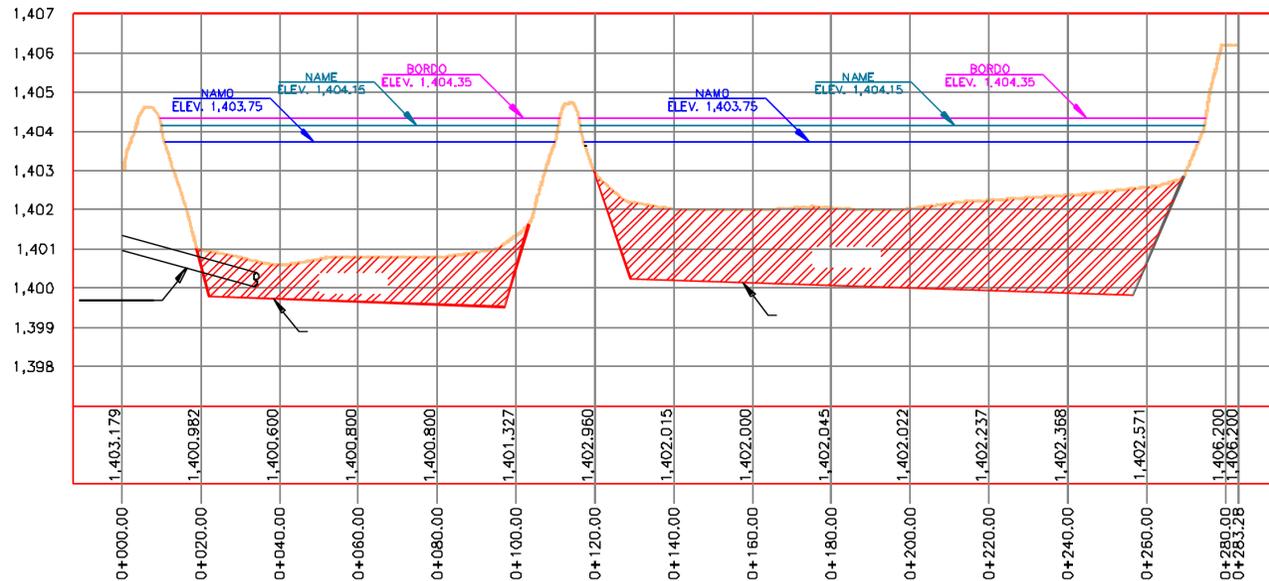


Status March 5, 2019





## East Lagoon System – BATHYMETRY Study



PERFIL POR EL EJE DE LAS LAGUNAS DE OXIDACION, NACO

ESCALA HORIZONTAL 1 : 2500  
ESCALA VERTICAL 1 : 250

1. Continuous infrastructure issues will require a more agile response from binational agencies (establishment of emergency funds)
2. Binational agreements to improve environmental enforcement and incentives are also required.
3. With limited resources and an aging infrastructure, NADBANK foresees Public-Private Partnerships as a viable scheme to continue financing water infrastructure
4. Because of water scarcity in the region, the development of desalination and reuse projects will continue to grow to meet water demand.