U.S.- Mexico Collaboration on Wastewater Infrastructure Serving the City of Mexicali, Baja California

EPA Border Infrastructure Construction Program
May 2005
EPA-supported Wastewater Projects in Mexicali

- Past: Planning, Immediate Need Projects & Mexicali I Project
- Present: Mexicali II Project
- Future
City of Mexicali Planning
Areas

Discharges will go to the
Las Arenitas WWTP
Mexicali II Project

- Remove 14 mgd of raw sewage currently discharging into the New River
- Convey the sewage for treatment to Las Arenitas, 26 km south of the City of Mexicali
- Construction is underway with completion projected in 2006.
Water Quality Benefits of Removing 14 mgd of Raw Sewage

- Remove the majority of **Pathogens**
- Increase **Dissolved Oxygen** & decrease **Odors** with a 43% reduction in BOD in the New River at the border
- Improve the **Clarity** of the New River with a 65% reduction in TSS
- Reduce **Nutrients** reaching the Salton Sea with a 10% reduction in phosphates
- Reduce **Volatile Organic Chemicals** with an enhanced Mexicali Monitoring and Pretreatment Program
Project Components

- Upgrade Pump Station 4
- Installation of 9 km of force main pipe
- Purchase and install additional 17 km of force main pipe
- Construct Las Arenitas Wastewater Treatment Plant

Mexicali II Project
Mexicali II Project: Treatment of Mexicali II Area Wastewater at Las Arenitas WWTP

<table>
<thead>
<tr>
<th>Cost Estimate</th>
<th>Millions of USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of force main pipe - Phase 1 (9 Km)</td>
<td>1.1</td>
</tr>
<tr>
<td>Purchase and install force main pipe – Phase 2 (17 km)</td>
<td>10.0</td>
</tr>
<tr>
<td>Upgrade Pump Station 4</td>
<td>3.0</td>
</tr>
<tr>
<td>Las Arenitas WWTP</td>
<td>11.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$ 25.9</strong></td>
</tr>
</tbody>
</table>

![Map showing the location of Mexicali II Project and Las Arenitas WWTP]
Sewage is collected but treatment capacity is lacking

Solidaridad Collector

Principal Collector

Pump Station 5
Locations of Significant Sewage Discharges:

Pump Station 5, Principal Collector, Solidaridad Collector & Nutrimex Collector

Pump Station 4 pumps sewage via the force main pipe 26 km to the Las Arenitas WWTP
Pump Station 4 Upgrade

- Upgrade of Pump Station 4 bid out
- Estimated Cost: $3M USD
- Est. Construction Period: 6 months

Mexicali II Project
Installation of 9 km of Force Main

- 9 km of Pipe from Pump Station 4 to El Choropo: Phase 1
- Pipe procured under Mexicali I project
- Cost: $1.1M USD
- Completed March 2004
- Construction Period: 5 months

Mexicali II Project
Procurement of 17 km of Force Main

- 48-inch Ductile Iron Pipe procured in December 2004
- Cost: $8.5M USD
- Initial 6 km of pipe delivered in Feb. 2005
- Final delivery no later than July 2005

Mexicali II Project
Installation of 17 km of Force Main

- Pipe installation started on March 30th
- Cost: $1.5M USD
- Est. Construction Period: 10 months

Mexicali II Project
Las Arenitas Treatment Plant

- 20 mgd plant to treat flows projected through year 2014
- Total Estimated Cost: $11.8M USD
- Construction began on April 18, 2005
- Estimated Construction Period: 14 months
Las Arenitas WWTP Discharge

- Treated wastewater from Las Arenitas WWTP will be discharged into a series of agricultural canals and travel 46 km southward before reaching the Rio Hardy, a tributary to the Colorado River Delta.
- The flow represents about 10% of the current New River flow at the border about 1% of the flows into the Salton Sea.
Monitoring & Pretreatment Program

As part of the Mexicali II Project:

- CESPM developed a Monitoring & Pretreatment Program for significant industrial and commercial dischargers.

- CESPM is implementing this program in coordination with the Department of Ecology. The program includes monitoring and inspection of over 300 dischargers.
EPA-supported Wastewater Projects in Mexicali

- Past: Planning, Immediate Need Projects & Mexicali I Project
- Present: Mexicali II
- Future
City of Mexicali Planning Areas

Discharges will go to the Las Arenitas WWTP
A collaborative facility planning effort began in 1996 to improve:

- Sanitary conditions in the Mexicali region
- The quality of water in the New River flowing across the international boundary into the U.S.
Infrastructure Planning

- Predates EPA’s Border Infrastructure Construction Program
- Initiated with EPA FY1995 Appropriated Funds
- Supported sewer survey and mapping
- Resulted in the Immediate Need Projects, Mexicali I Projects and Mexicali II Project
Immediate Need Projects

- Upgrade and Rehabilitate existing collection and treatment system
- Completed in 1997
- Total Cost: $7.5M USD
- U.S. Investment: $4.1M USD

Pump Station 2 improvements
Mexicali I Project

Improve wastewater services in the Mexicali I, II and III planning areas:

- First-time service to 46 colonias
- Construction, rehabilitation and expansion of pumping stations and wastewater treatment plant
- Replacement and construction of collectors and sewer lines
Mexicali I Project

- Construction, rehabilitation and expansion of facilities to serve Mexicali
- Total Cost: $51.5M USD*
- U.S. Investment: $23.6M USD
- Completion in mid-2005

* Does not include Japanese Bank loan
CESPM-EPA Mexicali I Projects

COLECTORES
- Norte
- Cuyutlán
- Villafontana
- Periférico

SUBCOLECTORES
- Anáhuac
- Cuatrociénegas
- Valle Dorado
- Lázaro Cárdenas
- Cárcamo de bombeo y emisor

REDES DE ALC. SANITARIO
- Col. Colosio y Ampliación
- Fracc. Mayos
- Fracc. Aztecas
- Fracc. Misión de San Ignacio
- Col. Cachanillas
- Reposiciones de subcolectores en diferentes puntos de la cd.
- Colector Calz. Luis D. Colosio

REDES
- Colonia Zaragoza
- Colonia Ahumadita
- Lotes Diversos
- Poblado San Fernando
- Poblado Río Colorado
- Colonia Mezquital
- Poblado Xochimilco
- Colonia Voluntad
- Colector Voluntad
- Subcolector Voluntad
- Construcción de la Estación de Bombeo de A.R. PB-8 (Zaragoza), en Mexicali, B.C.
- Construcción del Collector A.S. Col. Orizaba
Completion of the Mexicali I and Mexicali II projects will provide:

- Wastewater service to over 650,000 residents
- 100% service in the Mexicali I and II planning areas and
- Improved water quality in the New River
EPA-supported Wastewater Projects in Mexicali

- Past: Planning, Immediate Need Projects & Mexicali I Project
- Present: Mexicali II
- Future: Mexicali IV
Discharges will go to the Las Arenitas WWTP
U.S.- Mexico Collaboration on Wastewater Infrastructure Serving the City of Mexicali

- Mexicali I projects are complete
- Mexicali II projects are in construction and will be completed in 2006, less than 2 years from now
- CESPM is pursuing projects to address needs in the growing Mexicali IV area
- Binational Technical Committee will continue to meet and oversee progress on projects
Border Infrastructure Program

- EPA has provided between $100 million to $50 million a year since 1996 to address water and wastewater infrastructure issues.
- EPA funds of $500 million since 1996 have supported over 50 projects with a total cost of $1.3 billion
- 6 million border residents have benefited from improved access to safe drinking water and wastewater infrastructure
What does the Border Infrastructure Program mean for California?

This EPA program provides funds for

- Project development through the Project Development Assistance Program (PDAP) and
- Facilities construction through Border Environment Infrastructure Fund (BEIF) grants.
<table>
<thead>
<tr>
<th>PDAP Project for CA</th>
<th>PDAP Amount Authorized (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brawley Planning &amp; Preliminary Engineering</td>
<td>299,482</td>
</tr>
<tr>
<td>2. Calexico Financial Study</td>
<td>19,900</td>
</tr>
<tr>
<td>3. Heber Alternatives Analysis, Feasibility Study &amp; Step II</td>
<td>179,148</td>
</tr>
<tr>
<td>4. Palo Verde Water Sample Analysis</td>
<td>9,220</td>
</tr>
<tr>
<td>5. Seeley Planning, Financial Analysis &amp; Step II</td>
<td>249,617</td>
</tr>
<tr>
<td>6. Blythe Preliminary Engineering &amp; Environmental Assessment</td>
<td>174,586</td>
</tr>
<tr>
<td>7. Desert Shores Master Plans, Financial Analysis &amp; Step II</td>
<td>147,782</td>
</tr>
<tr>
<td>8. Desert Shores Quality Assurance Plan &amp; Final Design</td>
<td>80,550</td>
</tr>
<tr>
<td>9. El Centro Planning</td>
<td>234,226</td>
</tr>
<tr>
<td>10. Brawley Preliminary Engineering &amp; Feasibility Study</td>
<td>69,700</td>
</tr>
<tr>
<td>11. Niland Preliminary Engineering, Environmental and Financial Analysis</td>
<td>136,625</td>
</tr>
<tr>
<td>12. Calipatria Preliminary Engineering, Environmental and Financial Analysis</td>
<td>136,625</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>1,737,461</strong></td>
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</table>

Years 1997 – 2004

PDAP-Funded Projects in CA
<table>
<thead>
<tr>
<th>BEIF Project for CA</th>
<th>Population to Benefit</th>
<th>Project Cost (US $) (Cert.)</th>
<th>BEIF Amount Authorized (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Brawley, CA</td>
<td>26,770</td>
<td>13,761,638</td>
<td>6,390,736</td>
</tr>
<tr>
<td>2 Calexico, CA</td>
<td>26,400</td>
<td>11,330,000</td>
<td>6,477,128</td>
</tr>
<tr>
<td>3 Desert Shores, CA</td>
<td>1,208</td>
<td>1,203,000</td>
<td>193,869</td>
</tr>
<tr>
<td>4 Heber, CA (1)</td>
<td>3,400</td>
<td>3,383,800</td>
<td>1,082,725</td>
</tr>
<tr>
<td>5 Heber, CA (2)</td>
<td>-</td>
<td>6,872,871</td>
<td>2,528,375</td>
</tr>
<tr>
<td>Heber, CA (2) (additional funds)</td>
<td>-</td>
<td>-</td>
<td>1,515,146</td>
</tr>
<tr>
<td>Heber, CA (2) (Contingency)</td>
<td>-</td>
<td>-</td>
<td>219,240</td>
</tr>
<tr>
<td>6 San Diego, CA (SBWRP)</td>
<td>1,200,000</td>
<td>99,588,000</td>
<td>17,202,462</td>
</tr>
<tr>
<td>Deobligation Westmorland, CA</td>
<td>12000000</td>
<td>(200,200)</td>
<td></td>
</tr>
<tr>
<td>7 Westmorland, CA</td>
<td>2,300</td>
<td>4,407,220</td>
<td>1,977,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,260,078</td>
<td>140,546,529</td>
<td>37,386,981</td>
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</tbody>
</table>
## PDAP Project for Baja California

<table>
<thead>
<tr>
<th>PDAP Project Description</th>
<th>PDAP Amount Authorized (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mexicali Follow Up Actions: Closure &amp; Recovery Study, O&amp;M Study</td>
<td>180,584</td>
</tr>
<tr>
<td>2. Tecate Evaluation of Wastewater Treatment System, Step II Doc</td>
<td>139,978</td>
</tr>
<tr>
<td>3. Tijuana Survey &amp; Mapping of the Water and Wastewater System</td>
<td>492,680</td>
</tr>
<tr>
<td>4. Ensenada Design, Step II Doc. &amp; Feasibility Study</td>
<td>49,500</td>
</tr>
<tr>
<td>5. Tecate Development of a Leak Detection Study</td>
<td>202,809</td>
</tr>
<tr>
<td>6. Tecate Feasibility Study, Sludge Management</td>
<td>104,176</td>
</tr>
<tr>
<td>7. Tijuana Step II &amp; Environmental Impact</td>
<td>33,804</td>
</tr>
<tr>
<td>8. Mexicali Financial, Environmental, Mexican Environmental</td>
<td>102,224</td>
</tr>
</tbody>
</table>

**Total:** 1,305,755

**Years 1997 – 2004**
## BEIF-Funded Projects in B.C.

<table>
<thead>
<tr>
<th>BEIF Project for B.C.</th>
<th>Population to Benefit</th>
<th>Project Cost (US $) (Cert.)</th>
<th>BEIF Amount Authorized (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mexicali, BC (Mexicali I)</td>
<td>635,000</td>
<td>54,973,527</td>
<td>20,620,000</td>
</tr>
<tr>
<td>2 Mexicali, BC (Mexicali II)</td>
<td>-</td>
<td>30,161,574</td>
<td>12,854,050</td>
</tr>
<tr>
<td>3 Tecate, BC</td>
<td>66,164</td>
<td>10,050,994</td>
<td>3,718,780</td>
</tr>
<tr>
<td><strong>Tecate, BC (increase)</strong></td>
<td>-</td>
<td>-</td>
<td>650,000</td>
</tr>
<tr>
<td>4 Tijuana, BC (Par. Lines)</td>
<td>1,310,000</td>
<td>27,430,000</td>
<td>16,000,000</td>
</tr>
<tr>
<td>5 Tijuana, BC (Sana)</td>
<td>-</td>
<td>42,014,409</td>
<td>18,007,204</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>2,011,164</strong></td>
<td><strong>164,630,504</strong></td>
<td><strong>71,850,034</strong></td>
</tr>
</tbody>
</table>
## Other Projects Funded in CA & BC

<table>
<thead>
<tr>
<th>Other Project for CA &amp; BC</th>
<th>Population to Benefit</th>
<th>Project Cost (US $) (Cert.)</th>
<th>Other Amount Authorized (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 International WWTP</td>
<td>-</td>
<td>240,000,000</td>
<td>240,000,000</td>
</tr>
<tr>
<td>2 Tijuana Master Plan</td>
<td>-</td>
<td>2,000,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>3 Mexicali Planning &amp; Immediate Needs</td>
<td>-</td>
<td>13,400,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>255,400,000</td>
<td>Total: 252,000,000</td>
</tr>
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</table>
## Tribal Projects in the Border Region of CA

<table>
<thead>
<tr>
<th>Program</th>
<th># of Projects</th>
<th>$ Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tribal Border</td>
<td>12</td>
<td>14,328,417</td>
</tr>
<tr>
<td>Tribal WWTSA</td>
<td>1</td>
<td>141,000</td>
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<tr>
<td>Tribal DWTSA</td>
<td>1</td>
<td>550,000</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td><strong>14</strong></td>
<td><strong>15,019,417</strong></td>
</tr>
</tbody>
</table>
Summary of EPA-Funded Projects in CA and Baja CA

- BEIF/Other: $361M for 15 Projects
- PDAP: $3M for 20 Projects
- Tribal: $15M for 14 Projects

EPA has invested $380M in 49 Projects that have benefits in CA.
Common Goals of protecting public health and the environment