

US EPA ARCHIVE DOCUMENT

Wastewater Collection Rehabilitation for Main Lines in Tijuana, Mexico

Environmental Assessment



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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) administers the Border Environment Infrastructure Fund (BEIF), which provides grant funding for water and wastewater infrastructure projects located along the international boundary between the United States (U.S.) and Mexico. EPA policy for use of border funds requires evaluation and certification of projects by the Border Environment Cooperation Commission (BECC) as a condition for grant award. As part of the BECC certification process, the proposed project must comply with (1) Mexican environmental regulations and (2) the National Environmental Policy Act (NEPA). The EPA requires compliance with NEPA before BEIF funds can be authorized. Projects within 62 miles (mi) (100 kilometers [km]) of the U.S./Mexico border are eligible for BEIF assistance.

In accordance with the U.S. Council of Environmental Quality (CEQ) regulations, 40 CFR Parts 1500-1508, and EPA regulations (40 CFR Part 6) as guidance, this Environmental Assessment (EA) documents the environmental consequences in the U.S. of the proposed federal action. The purpose of this document is to comply with NEPA documentation requirements for the proposed federal action under consideration.

1.1 STUDY LOCATION

The proposed project is located in the City of Tijuana, in the state of Baja California in northwestern Mexico. The City of Tijuana is within the larger municipality of Tijuana, which has a population of 1,650,351 people, an area of approximately 538 square miles (1,393 square kilometers), and contains the municipal delegations of San Antonio de los Buenos, Playas de Tijuana, Centro, Sánchez Taboada, La Mesa de Tijuana, Cerro Colorado, La Presa, Centenario, and Mesa de Otay.

The City of San Diego is the U.S. city located directly north of Tijuana. San Ysidro is a community within the City of San Diego located directly on the U.S./Mexico border across from Tijuana. The City of Tijuana is connected to the San Ysidro district of southern San Diego in the United States by the San Ysidro and Otay Mesa Border Crossing Stations. The San Ysidro border crossing is the busiest land-border crossing in the world, with over 50 million people using the crossing each year.

The area of concern for this EA is relatively flat in the U.S. and hilly in Mexico, generally ranging from sea level to about 800 feet (245 meters) above mean sea level (amsl) in elevation. The low-lying parts of the City of Tijuana have an elevation of about 65 feet (20 meters) amsl.

The project area is in the vicinity of the Tijuana River, which originates in the Sierra de Juárez Mountain Range. The 120 mile (193 kilometer) river flows north through Mexico and into the United States before draining into the Pacific Ocean. The project collector lines range from approximately 1,150 feet (350 meters) south of the U.S./Mexico border to 3.4 miles (5.5 kilometers) south of the border.

1.2 PURPOSE AND NEED

The purpose of the proposed action is to improve the wastewater collection system and sanitary conditions within the City of Tijuana. The project is needed to address the deteriorated condition of existing major sewer collector lines and manholes within the City which result in raw sewage leaks to ground and surface water within the Tijuana River watershed and potentially impacting the Tijuana River. Thus, on those days when Tijuana River flows reach the U.S., the implementation of the proposed project would reduce the potential adverse impacts to U.S. surface water. The proposed project will improve public health and water quality concerns by eliminating the discharge of raw sewage to Tijuana streets. Public safety concerns will also be addressed by reducing the risk and potential for collapse of major sewer collectors and manholes and associated ground subsidence. The lack of reliable wastewater collection lines has had consequences for the environment of Tijuana, as well as for the quality of life of its inhabitants. All of the collection lines that are part of the proposed action have shown evidence of damage, often in the form of leaks and collapses.

1.3 SCOPE OF ANALYSIS

Although the project is located in Mexico, this EA evaluates the impacts to the relevant environmental resources within the defined area of concern in the U.S. As defined in the CEQ regulations (§1508.25), the scope consists of the range of actions, alternatives, and impacts to be considered in a NEPA-compliant document.

2.0 PROJECT DESCRIPTION AND ALTERNATIVES

In accordance with Council on Environmental Quality (CEQ) regulations (§1502.14), this section of the EA: 1) presents and objectively evaluates the alternatives, including the No Action alternative; 2) devotes substantial treatment to each alternative considered in detail so the reviewers may evaluate comparative merits; and 3) includes appropriate mitigation measures.

2.1 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Alternatives related to stormwater or wastewater treatment were not included in the scope of this project. Among the range of possible gravity sewer collection projects, alternatives that were not deemed constructible, such as those that would require extended closures of the City's most important roads or would be prohibitively expensive, were not considered for detailed study.

2.2 PROPOSED ACTION

The proposed action would rehabilitate or replace 5.5 miles (8.9 kilometers) of collector lines with diameters ranging from 8 to 42 inches (20 to 107 centimeters) and rehabilitate approximately 37 manholes and construct an additional 10. The proposed project would occur on Tijuana's *Industrial* Collector, *Las Américas* Collector, *Techite* Collector, *Sánchez Taboada* Collector and *Artículo 123* Collector. The first four collectors discharge to the South Bay International Wastewater Treatment Plant (SBIWTP) or the San Antonio de los Buenos Wastewater Treatment Plant (WWTP), depending on the volume of sewage within the Tijuana wastewater collection system. The fifth collector discharges to the San Antonio de los Buenos WWTP.

2.3 EXISTING INFRASTRUCTURE

The Comisión Estatal de Servicios Públicos de Tijuana or CESPT is the utility in Tijuana that operates the water and wastewater systems for Tijuana and Playas de Rosarito. Essentially all residents and businesses in the project area, which is in the central part of Tijuana, are connected to the sewer collection system. Within the Tijuana municipality as a whole, wastewater collection service coverage is 90 percent (BECC 2012).

In the project area, wastewater from the collection system flows by gravity to two large collector lines that run parallel to the Tijuana River, one on each side. The *Poniente* (West) Collector conducts wastewater from the western side of the City and the *Oriente* (East) Collector conducts wastewater from the eastern side of the City. Both the *Oriente* and *Poniente* collectors empty to the *Internacional* Interceptor, which brings the wastewater to treatment facilities.

Figure 1-1 in Section 1 contains an overview of the existing pumping and treatment infrastructure.



Figure No. 1-1
Overview of Study Area
November 2013

Figure 2-1 shows the five collector lines that are part of the proposed action.



Figure No. 2-1
Overview of the Proposed Action
November 2013

There are four existing wastewater treatment plants that treat wastewater from within the Tijuana River Watershed: the San Antonio de los Buenos WWTP, the South Bay International Wastewater Treatment Plant (SBIWTP), the La Morita WWTP, and the Arturo Herrera WWTP.

The San Antonio De Los Buenos plant has capacity to treat up to 25 MGD (1,100 L/s) of Tijuana and Playas de Rosarito wastewater. Based on data from January through October, the CESPT projects that the plant will treat an average of 25.3 MGD (1,110 L/s) in 2013. The plant is located 4.3 miles (7 km) south of the border and discharges effluent into the Pacific Ocean at Punta Bandera. When the capacity of the existing WWTP is exceeded, the plant discharges a combination of treated wastewater and chlorinated-only wastewater. It has been suggested that the coastal currents in the region sometimes move from south to north, creating the possibility that discharges from the San Antonio de Los Buenos Wastewater Treatment Plant may occasionally affect the quality of the water along the coastal U.S.

The SBIWTP is in San Ysidro, California at the U.S./Mexico border, and treats wastewater generated exclusively in Tijuana. The SBIWTP provides secondary treatment with a capacity of 25 MGD (1,100 L/s) and discharges effluent through an underwater outfall pipe (the South Bay Ocean Outfall (SBOO)) into the Pacific Ocean. The SBOO extends 3.5 miles into the ocean and has a tunnel 11 feet in diameter, and a capacity of 175 MGD (7,623 L/s) which helps to dilute effluent entering the ocean and to reduce environmental impacts. SBIWTP discharges are subject to California water quality standards and are specified in the National Pollution Discharge Elimination System (NPDES) permit for the plant. The SBIWTP treats an average of 25 MGD (1,100 L/s).

The La Morita WWTP, with a design capacity of 5.8 MGD (254 L/s) provides advanced secondary treatment using an oxidation ditch activated sludge treatment process followed by filtration and UV disinfection. Based on data from January through October, the CESPT projects that the plant will treat an average of 4.5 MGD (199 L/s) in 2013. The WWTP is located approximately 6.5 miles (10 km) south of the border and 2.9 miles (4.7 km) east of the Arturo Herrera WWTP. The plant discharges to the Tijuana River via the Matanuco Creek.

The Arturo Herrera WWTP has a design treatment capacity of 10.5 MGD (460 L/s). This plant, also located within the Tijuana River basin, provides advanced secondary treatment similar to La Morita and has two modules of 5.25 MGD (230 L/s) each. Based on data from January through October, the CESPT projects that the plant will treat an average of 5.7 MGD (248 L/s) in 2013. The WWTP is located approximately 6.5 miles (10 km) south of the border. It also discharges to the Tijuana River.

Flows in the Tijuana River (which are a combination of groundwater, natural runoff, treated wastewater effluent, potable water leaks, sewer leaks and spills) are intercepted at the border before crossing into the U.S by the CILA pump station. From the CILA pump station, flows are directed to the *Internacional* interceptor and combined with sewage flows from the Tijuana wastewater collection system. Approximately 25 MGD (1,100 L/s) of the flow conveyed by the *Internacional* Interceptor runs by gravity to the SBIWTP and the rest continues to Pump Station 1 where it is pumped to the San Antonio de los Buenos WWTP. The CILA pump station currently removes up to 22.8 MGD (1,000 L/s) of river flows and stops operating in wet weather

when river flows exceed that capacity. At these times, water is allowed to flow into the U.S., discharging to the Pacific Ocean via the Tijuana River estuary.

Construction has recently been completed on the *Sistema de Alejamiento de Aguas Superficiales* (SAAS), a new surface water removal system that is projected to be placed into operation within the year. The new system, which includes pumping capacity at the CILA Pump Station, the new Pump Station 1A, force mains, and gravity mains, will intercept at least 34.2 mgd (1,500 L/s) of water from the Tijuana River at the CILA pump station and send it, via Pump Station 1A, to the Pacific Ocean at Punta Bandera. The water in the SAAS system will not mix with untreated wastewater or pass through a wastewater treatment plant. The system will provide chlorination at the ocean discharge only when needed. Operation of the SAAS system will relieve the extra burden of river water that is currently affecting the wastewater pumping, conveyance, and treatment infrastructure in Tijuana, and will reduce the number of instances of hydraulic capacity exceedance at the San Antonio de los Buenos WWTP.

2.4 ALTERNATIVE 1 - NO ACTION ALTERNATIVE

Under the no action alternative, no sewer collector line repair or rehabilitation would take place. The *Industrial*, *Las Américas*, *Techite*, *Sánchez Taboada*, and the *Artículo 123* Collectors would continue to be used in their current states, with repairs occurring only following major incidents such as collapses. Figure 2-1 shows the locations of these five collector lines.

Current conditions include:

- Higher than normal rainwater infiltration, which can cause can cause backups or excessive water being delivered to the WWTP.
- The escape of wastewater to the open air and undermining and sinking of the street in areas of heavy truck traffic.
- Leaks to the ground and surface water in the Tijuana River watershed.
- Collapse and deterioration of the concrete and iron structures of the manholes allowing odors to escape.
- Deteriorated concrete piping material with aggregate materials and bar wrapping exposed.
- Blockages of the collector lines.

2.5 ALTERNATIVE 2 – PREFERRED ALTERNATIVE

The preferred alternative would either rehabilitate or replace five main collector lines, over a total length of 5.5 miles (8.9 kilometers) ranging in diameter from 8 to 42 inches (20 to 107 centimeters). The alternative also includes the rehabilitation of approximately 37 manholes and the construction of 10 new manholes.

The inspection of the *Industrial* Collector showed the existing collector in a weakened and deflected condition, making it a poor candidate for cleaning, especially with the heavy truck traffic that the road receives. Replacement within the road is proposed, using pipe bursting on the majority of the length, with open cut replacement in some segments. Two new manholes are anticipated to be added where the collector length between manholes is more than 377 feet (115 meters). If hidden manholes are discovered, they will be brought to grade, and if badly deteriorated manholes are discovered, they will be rehabilitated.

During construction, wastewater flows in the collector would be redirected to one of the smaller parallel lines that flows to the *Oriente* Collector as part of the wastewater collection grid. No wastewater would be sent to the storm sewers.

In the *Lomas de Agua Caliente* neighborhood, the *Las Américas* Collector would be replaced by pipe bursting, with a small contributing line replaced using open cut. In the *20 de Noviembre* neighborhood, the existing concrete *Las Américas* Collector line would be replaced by open cut with PVC. In the *Buena Vista* neighborhood, the *Las Américas* Collector would be replaced by pipe bursting, while two other connecting sewer lines would be replaced, one by open cut and one by pipe bursting.

Wastewater that would normally flow to the project collectors during construction in *Lomas de Agua Caliente* would be sent to a storm sewer that would flow to the Tijuana River Canal, would combine with river water, and would be captured by the SAAS system. The SAAS system normally discharges to the Pacific Ocean at Punta Bandera, but to avoid any raw wastewater discharges to the ocean during construction, the water in the SAAS system would be diverted to the San Antonio de Los Buenos WWTP. The diversion and treatment of the water in the SAAS system at the WWTP would continue throughout the duration of the construction in the *Lomas de Agua Caliente* neighborhood. In *20 de Noviembre* and *Buena Vista*, wastewater needing to be diverted during construction would be sent to other wastewater lines draining to either the *Poniente* or *Oriente* Collectors.

The *Techite* twin collector lines run down the wide median of the busy and economically vital boulevard, *Paseo de los Heroes*. It is proposed that 10 new manholes be constructed and 12 existing manholes be rehabilitated along this line. Any design must consider the importance of keeping traffic flow open on the road and the park-like line of mature trees in the median. During the tie-ins, wastewater would be diverted out of the *Techite* twin collectors and to other lines leading to the *Poniente* Collector.

The *Sánchez Taboada* Collector line would be replaced in the adjacent street using open cut construction and a combination of PVC pipe with either fiberglass reinforced plastic (FRP) or high density polyethylene (HDPE). The existing line would continue to operate during construction. During the tie-in to the new line wastewater in the collector would be diverted to a storm sewer. The wastewater in the storm sewer would flow to the Tijuana River Canal, where it would be sent to the San Antonio de los Buenos WWTP via the SAAS system.

In the area designated for Phase 2, the *Sánchez Taboada* Collector follows the busy *Sánchez Taboada* boulevard. Both pipe bursting and open cut methods would be used during this phase. Manholes would be rehabilitated for the entire length of Phase 2 work. When wastewater diversions were necessary, the wastewater would be diverted to storm sewers that would direct the wastewater to the Tijuana River Canal, to be treated at the San Antonio de los Buenos WWTP via the SAAS system.

The *Artículo 123* Collector, also called the *INV* Collector is located under the narrow, residential, winding, *Artículo 123* road, part of which is paved and part of which is unpaved. Rehabilitation would be primarily by pipe bursting with some small segments of open cut construction.

Wastewater that would normally flow to the project collector during construction would be diverted, using plugs and sump pumps when necessary, to other lines within the wastewater collection grid.

3.0 AFFECTED ENVIRONMENT

This section describes the environmental resources in the U.S. that may be affected by the proposed action or the no action alternative described in Section 2. The description of the environmental setting focuses on environmental resources located within the U.S. near the U.S.-Mexico border. However, environmental resources in Mexico are also described in some instances when there is a direct correlation between resources in both countries.

3.1 LAND USE

Urban development extends north from the City of Tijuana to the border. The environmental setting in the vicinity of the border in the U.S. is characterized by a combination of urban, industrial, rural and open space land uses. Important features of this area include the Pacific Ocean, the Tijuana River Valley, and the community of San Ysidro, the main urban border community in the U.S. within the study area.

Important land uses in the Tijuana River Valley are the Tijuana River National Estuarine Research Reserve (TRNERR), the Imperial Beach Naval Air Station, the Border Field State Park and the San Diego County Tijuana River Valley Regional Park. The Tijuana River Estuary is designated by the National Park Service as a National Natural Landmark (NPS 2013).

The Mexican Federal government has designated 173 Natural Protected Areas in Mexico. The closest Natural Protected Area in Mexico to the area of concern is the *Constitucion de 1857*, approximately 70 miles (113 km) southeast of Tijuana (Comisión Nacional de Áreas Naturales Protegidas 2007). Located in the pine forests of Sierra de Juárez mountain range, the park is an important preserve for a large number of native wild animals like Bighorn Sheep and Mule Deer. The park is characterized by the large variety of coniferous species.

Important farmland including areas of prime farmland, farmland of statewide importance, and farmland of local importance are located in and around the Tijuana River Estuary, to the west of U.S. Interstate 5 and south of Imperial Beach (State of California Department of Conservation 2012).

The coastal zone boundaries extend west from the point where the Tijuana River enters the U.S. to the Pacific Ocean, which includes the entire Area of Concern in the U.S. Per the California coastal Act of 1976, any development activities within the coastal zone boundary must be approved by either the Coastal Commission or the local government.

3.2 TOPOGRAPHY AND SOILS

Topographic features include the relatively flat alluvial plain of the Tijuana River with tributary canyons and hillsides extending up into Mexico. The elevations in the study area range from sea level at the Pacific Ocean, to 100 feet (30 m) in the Tijuana River Canal in Mexico, to nearly 800 feet (244 m) at the highest of the sewer collector lines described in Section 2.

The mudflats at the mouth and lower parts of the Tijuana River Estuary are occasionally covered by sands transported during storms from the beach Saline Chino. The soils suitable for agriculture occur upstream from the flats. To the south, the fine sandy loams blanketing the

mesas and terraces are also considered highly erodible and are contributing substantially to downstream sedimentation (TRNERR 2010).

3.3 WATER RESOURCES

3.3.1 Surface Water

The two most important surface water features in the area of concern are the Tijuana River and the Pacific Ocean. The Tijuana River originates at the confluence of Arroyo del Alamar and Río de las Palmas in Mexico and drains into the Pacific Ocean. The Tijuana River watershed is 1,700 square miles with 73 percent in Mexico (TRNERR 2012). Flows in the river consist typically of a combination of natural runoff, effluent discharges, and fugitive flow resulting from water and wastewater leaks.

Mexico has agreed to intercept the flow of the Tijuana River during the dry season for its transport to the SBIWTP and the San Antonio de los Buenos WWTP for treatment and disposal. During the rainy season, however, the Tijuana River flow is allowed to continue into the U.S. and to discharge into the estuary whenever the flow exceeds 22.8 MGD (1,000 L/s). Flow records from the U.S. International Boundary and Water Commission (USIBWC) show that in 2008 and 2009, the two most recent years for which the data are available, there were 111 and 116 days, respectively, on which surface water flowed from Mexico to the U.S. These days occurred mostly during the typically rainy season of December through March.

A 2009-2010 study of water quality in the Tijuana River suggests that raw wastewater discharge is the likely source of much of the river’s impairment (Weston Solutions 2011).

Table 3-2 lists water quality data in the Tijuana River during a random dry weather sampling on discrete dates in 2009 and 2010. Measurements were taken at a multi-sector general permit site, MS4D-TJR-07 near the mouth of the Tijuana River.

Table 3-2 Water Quality Measurements in the Tijuana River during Dry and Wet Weather

		Enterococcus (MPN/ 100ml)	TSS (mg/L)	TDS (mg/L)	Nitrite as N (mg/l)	Total Phosphorus (mg/L)	Fecal Coliform (MPN/100mL)	Ammonia as N (mg/l)
Dry Weather Assessment	03/17/2010	500,000	2,150	720	<0.05	14.619	9,000,000	16.4
	05/11/2010	1,300,000	710	1,200	<0.15	9	5,000,000	20
Wet Weather Assessment	11/28/2009	≥16,000,000	5,717.5	560	0.56	15.893	5,000,000	8.4
	02/06/2010	2,400,000	2,630	1,770B	<0.75	13.745	5,000,000	14.83

B-Analyte was detected in the associated method blank.

Source: Weston Solutions 2011

Table 3-3 shows the California Basin Plan standards for water quality constituents of concern. Tijuana River flows shown in **Table 3-2** do not meet these standards.

Table 3-3 California Basin Plan Standards

Parameter	CA Basin Plan Standards ¹
Ammonia (NH ₃)(mg/L)	0.025 mg/l in inland surface waters and estuaries
Phosphorus (total) (mg/L)	0.1 mg/L
Nitrite (as nitrogen) (mg/L)	1.0 mg/L
Fecal Coliform (MPN/100mL)	200/100 mL (30-day period, five samples)

¹Source: California Regional Water Quality Control Board

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/update082812/Chpt_3_2012.pdf

Ocean water quality in the vicinity of the international border is affected by surface runoff that flows to the ocean and by discharges from wastewater plants. The San Antonio de los Buenos WWTP, located approximately 4.3 miles (7 km) south of the border, discharges a combination of treated wastewater and chlorinated raw wastewater directly in the ocean. It has been suggested that the coastal currents in the region occasionally move from south to north, creating the possibility that some discharges from the San Antonio de los Buenos WWTP affect the quality of the water in the San Diego Bay in the United States.

The SBIWTP is located in San Diego and treats wastewater from Tijuana at a secondary level. The SBIWTP discharges into the bay through an underwater outfall pipe (i.e., the South Bay Ocean Outfall – SBOO), which helps to dilute effluent entering the ocean and to reduce environmental impacts.

The City of San Diego performs monthly compliance monitoring for the SBOO. The sampling area extends from the tip of Point Loma, California southward to Playa Blanca, Baja California, Mexico, and from the shoreline seaward to a depth of 200 ft (61 m). There was no evidence that the wastewater plume from the South Bay outfall reached recreational waters in 2012.

3.3.2 Groundwater

Groundwater in the lower Tijuana River Valley occurs in the following three zones: (1) beneath Nestor Terrace north of the valley, (2) in the alluvial fill underlying the Tijuana River valley, and (3) in the San Diego Formation beneath the alluvium. The primary source of aquifer recharge appears to be the Alamar River. Other likely sources of recharge are winter rainfall, water line leakage in Tijuana, and discharge from surrounding sedimentary bedrock terraces. Recharge to the alluvial aquifer from the Tijuana River surface flow is more prominent in the U.S. than Mexico, since the Tijuana River is a concrete lined channel from the international border to Rodriguez reservoir. The primary aquifer discharge zone is the Pacific Ocean (BECC 2008).

There is currently no known extraction of groundwater from the Tijuana River basin in the U.S. for any purpose except for limited agricultural use. As of 1993, groundwater extraction in the Tijuana River valley north of the international border was 1,400 acre feet per year (BECC 2008).

Groundwater in the basin is rated generally inferior for domestic use and inferior for irrigation purposes. High levels of total dissolved solids and sodium chloride prevent the use of groundwater for salt-sensitive crops (BECC 2008).

3.3.3 Floodplains

The Tijuana River transitions from a natural river bed, south of Tijuana, to a concrete lined canal designed to hold floodwaters, as the river passes through the highly urbanized City of Tijuana.

Downstream of the border, the U.S. IBWC operates the Tijuana River Flood Control Project, which extends for 2.3 miles (3.7 km) (IBWC 2005). Downstream of the IBWC flood control project, the Tijuana River valley in the U.S. consists of a broad natural floodplain containing a variety of wetland and riparian areas. A wide swath of the Tijuana River valley in the U.S. is in the 100-year floodplain. A 100-year flood has a 1 percent chance of occurring in any given year.

3.3.4 Wetlands

The 2,800 acre TRNERR was designated as a wetland of international importance within the nation. It extends east from where the Tijuana River meets the Pacific Ocean and encompasses tidally flushed wetlands, riparian and upland habitats extending immediately north of the U.S. and Mexico border (City of San Diego 2007). The closest key wetland in Mexico to Tijuana identified by Ducks Unlimited de México is a palustrine emergent wetland measuring 4,675 acres (1,892 hectares) located approximately 127 miles (205 kilometers) to the southeast of Tijuana.

3.4 AIR RESOURCES

The San Diego Air Basin (SDAB) would, in general, be the area of influence for this project. The climate in San Diego County is typical of a Mediterranean climate. In general, most rains fall from January to March. Average temperatures reach annual lows of 46°F (8°C) in winter and rise to 74°F (23°C) in summer. Prevailing winds come from the northwest in winter and from the southwest in summer. Weather is monitored at the TNERR as part of the NERR System-Wide Monitoring Program (SWMP) (TRNERR 2010).

3.4.1 Air Quality

The federal Clean Air Act (CAA) of 1970 and the CAA Amendment in 1977 required the adoption of national ambient air quality standards (NAAQS) for sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), hydrocarbons (HC), ozone (O₃), particulates of less than 10 microns in size (PM-10) and lead (Pb). In addition, the California Air Resources Board (CARB) has established state standards that are generally more restrictive than the national ambient air quality standards (NAAQS), and include sulfates, hydrogen sulfide (H₂S), vinyl chloride, and visibility reducing particles.

Table 3-1 shows the annual number of days that pollutants exceeded the state and federal ambient air quality standards in the SDAB during 2008 to 2012.

Table 3-1 Summary of Air Quality Data for the San Diego Air Basin

Pollutant		Number of Days over Standard				
		2008	2009	2010	2011	2012
Ozone (8-Hour Standard)	Federal ^A	35	24	14	10	10
	State	69	47	21	33	25
Particulates (PM10)	Federal	6.1	0	0	0	0*
	State	163.4	146.4	136	138.5	6.1
Particulates (PM2.5)	Federal	3.5	3.4	2.0	3.0	1.0

Source: <http://www.arb.ca.gov/adam/>

*Insufficient Data Available

^A National '08 8-Hour

The SDAB currently has a federal and state ozone designation of nonattainment (CARB 2012). The SDAB is listed as unclassified with the federal standards for PM-10, and unclassified/attainment for PM-2.5, but is currently listed in non-attainment status for both with the state standards (CARB 2012).

3.4.2 Odor

Odors have been reported in the vicinity of the *Techite* and *Sánchez Taboada* collector lines and are thought to be due to H₂S production resulting from inadequate maintenance, caused by the wide spacing between manholes. These odors are localized and do not affect the area of concern in the U.S.

3.5 NOISE

The area of concern with respect to noise is limited to those areas in the U.S. that are immediately adjacent to the international boundary.

Due to the highly urbanized nature of Tijuana and the area of concern immediately near the international border on both sides, the area of concern is characterized primarily by vehicular noise from car and truck travel, commercial aircraft noise from operations at the Tijuana Airport, aircraft operations associated with Brown Field and the Imperial Beach Naval Auxiliary Landing Field, and general urban activities.

3.6 VEGETATIVE HABITAT

San Diego County falls under the Southern and Central California Chaparral and Oak Woodlands ecoregion. This region is characterized as having a Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising mainly chaparral and oak woodlands with grasslands occurring in some lower elevations and patches of pine being found at higher elevations (EPA 2013).

Habitat types within the Tijuana River Valley and Tijuana Estuary include beach, saltpan, southern foredunes, tidal estuary, coastal salt marsh, riparian wetlands, coastal sage scrub, southern maritime chaparral, maritime succulent scrub, southern willow scrub, and mulefat scrub (USIBWC 2005).

For the most part, the portion of the River Valley located between the international border and Dairy Mart Road is devoid of notable biological resources while areas west of Dairy Mart Road and north of Monument Road support a variety of bird species and are high in habitat value. The subject area is interspersed with agricultural, equestrian, mining, and rural residential uses, but, overall, is still rich in wildlife values. The most notable area of biological resources is the Tijuana Estuary, which extends approximately 3 miles east from the Pacific Ocean (BECC 2008). The Tijuana Estuary is an essential breeding, feeding, and nesting ground for over 370 bird species (California Department of Parks and Recreation 2013).

The Tijuana Estuary is classified as a Coastal Plain Estuary with several different habitats occurring within the Estuary (BECC 2008).

3.7 WILDLIFE RESOURCES

The Tijuana River estuary is home to at least 370 species of birds, 320 of which are migratory. Mammals that inhabit the estuary land include mice, California ground squirrels (*Otospermophilus beecheyi*) and rabbits. The estuary's small tidal creeks and channels contain at least 20 species of fish, plus crabs, rove beetles (*Staphylinus sp.*), tiger beetles (*Cicindela sp.*), and wandering skippers (*Panoquina errans*) (IBWC 2005).

3.7.1 Threatened and Endangered

The U.S. Fish and Wildlife Service has listed 44 threatened or endangered species as having the potential to occur in San Diego County. Federally listed endangered and sensitive species may be found in the general vicinity of the estuary where suitable habitat is present (IBWC 2005).

3.8 CULTURAL RESOURCES AND AESTHETICS

There are no Native American reservations in the area of concern in the U.S. (EPA, 2011). There are 208 locations in San Diego County listed on the National Register of Historic Places, California State Historical Landmark, California Register of Historical Resources or as a Point of Historical Interest (OHP, 2013).

3.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The racial composition of the City of San Diego and the State of California are both predominantly white with the City of San Diego boasting a lower unemployment rate and a 0.2 percent higher poverty rate. San Diego County is projected to grow at a slower rate than the State of California through 2050.

3.10 MUNICIPAL SERVICES

3.10.1 Water and Wastewater Services

The CESPT provides water and sewer service for Tijuana and Playas de Rosarito. Essentially all residents and businesses in the project area are connected to the water distribution and wastewater collection systems (BECC 2012).

3.10.2 Waste Management

Solid waste collection is provided by the Municipality with a coverage rate of 83 percent in the Municipality as a whole and 93 percent in the urban center (Ayuntamiento de Tijuana 2010). Solid waste is sent to two private landfills, in Tijuana and Playas de Rosarito, operated by the company GEN Tijuana.

3.10.3 Transportation

The District of San Ysidro's location on the US/Mexico border allows events in Tijuana to potentially influence conditions in Mexico, and vice versa. The distance from the center of San Ysidro to downtown Tijuana is only about 2.85 miles (4.59 kilometers). As the busiest land port of entry in the western hemisphere, the San Ysidro Land Port of Entry processes 50,000 northbound vehicles and 25,000 northbound pedestrians each day (U.S. General Services Administration 2013).

3.10.4 Energy

Ninety nine percent of residents of the Tijuana municipality have access to electricity (SEGOB 2010). Electricity is provided by the Federal government through the *Comisión Federal de Electricidad* throughout Mexico.

3.11 HUMAN HEALTH AND SAFETY

Current health concerns are associated with discharges of raw or inadequate sewage collection in neighborhoods in Tijuana.

4.0 ENVIRONMENTAL CONSEQUENCES

Potential impacts are described for each of the alternatives considered. Not all the resource areas are discussed in Section 4.0. Areas where no impacts would occur have not been analyzed. For the resource areas where effects will occur, the different types of effects (e.g. beneficial, adverse) are identified for each resource (e.g. air, water). Furthermore, cumulative impacts and irreversible commitment of resources for each alternative are described.

The description of impacts is focused specifically on impacts to U.S. resources, but may contain descriptions of impacts in the entire Area of Concern, which encompasses the City of Tijuana, the community of San Ysidro, the Tijuana River from Tijuana to the Pacific Ocean, the sites of proposed wastewater collection improvements, the existing wastewater treatment plants, and effluent discharge locations.

Under the no action alternative (Alternative 1), rehabilitation and/or replacement of the main collector lines and existing manholes would not occur and the use of the existing infrastructure would continue. Alternative 2 seeks to either rehabilitate or replace five main collector lines, a total length of 5.5 miles (8.9 kilometers) ranging in diameter from 8 to 42 inches (20 to 107 centimeters). The alternative also includes the rehabilitation of approximately 37 manholes and the construction of 10 new manholes.

4.1 LAND USE

Under the no action alternative, rehabilitation and/or replacement of the main collector lines and existing manholes would not occur and the use of the existing infrastructure would continue. The no action alternative would not affect land, use since no construction would take place.

There would be no transboundary effects on land use for Alternative 2. All construction would take place in existing streets and right-of-ways in Mexico. No construction would take place that would affect important farmland or coastal zones.

4.2 SOILS AND TOPOGRAPHY

Under the no action alternative, adverse impacts to soil from raw sewage and spillovers from failing collector lines would continue since no rehabilitation and/or replacement of the main collector lines and existing mainholes would occur.

The proposed action would address the adverse impacts to soil of raw sewage from the aging collection line system. During construction, standard measures will be in place to control erosion and dust.

4.3 WATER RESOURCES

4.3.1 Surface Water

Under the no action alternative, intermittent raw sewage leaks and spillovers would continue to occur within the Tijuana River watershed from the deteriorated collector lines. These leaks have a negative impact on surface water quality in Mexico. In addition, on those days when the

Tijuana River flows into the U.S., there potentially could be adverse impacts to water quality on the U.S.-side from contamination of the river water from raw sewage.

With the proposed action, surface water quality within the Tijuana River will improve since there will be a reduction in raw sewage leaks from failing collector lines within the Tijuana wastewater collection system. Thus, on those days when Tijuana River flows into the U.S., the potential adverse impact to U.S. surface water would also be reduced.

During construction, wastewater flows would be diverted to unaffected collection lines within the Tijuana wastewater collection system.

4.3.2 Groundwater

Under the no action alternative, intermittent raw sewage leaks and spillovers would continue to occur within the Tijuana River watershed from the deteriorated collector lines. These leaks have a negative impact on groundwater water quality in Mexico. In addition, on those days when the Tijuana River flows into the U.S., there potentially could be adverse impacts to groundwater quality on the U.S.-side from contamination of the river water from raw sewage.

With the proposed action, groundwater quality will improve since there will be a reduction in raw sewage leaks from the fail from failing collector lines within the Tijuana wastewater collection system.

During construction, wastewater flows would be diverted to unaffected collection lines within the Tijuana wastewater collection system.

4.3.3 Floodplains

Floodplains would not be affected under the no action alternative since no construction would take place with this alternative..

With the proposed action, all construction would be underground within the urban setting of Tijuana. There would not be any impacts to the volume of surface water flows to the Tijuana River during construction or operation. In addition, there will not be a substantial change in the volume of surface water flowing to the Tijuana River from the proposed project, thus there would be no impacts to floodplains.

4.3.4 Wetlands

Wetlands would not be directly affected by the no action alternative since no construction would take place.

Wetlands would not be directly affected by the proposed action alternative since no construction would take place in or around wetlands. In addition, the volume of surface water to the Tijuana River would not substantially increase, thus there would not be any indirect impacts to wetlands.

4.4 AIR RESOURCES

4.4.1 Air Quality

No impacts to air quality would occur from the no action alternative.

Under proposed action, impacts to air quality from construction activities would be temporary and would return to their original ambient levels once construction activities cease. There would be no longer term impacts to air quality from the proposed project.

4.4.2 Odors

Under the no action alternative, there would be no changes to odors within the project area. Air quality may be improved with the proposed action since there would be an elimination of odors within the immediate vicinity of the collection lines.

4.5 NOISE

Due to the highly urbanized nature of Tijuana, there would be not be any significant increase in noise levels from the proposed action.

4.6 VEGETATIVE RESOURCES

Under the no action alternative, there would be no impacts to vegetative resources since no construction would occur. For the proposed action, all activities would be within existing streets in the urbanized setting of Tijuana. Vegetation within the project area is highly disturbed.

4.7 BIOLOGICAL RESOURCES

Under the no action alternative, there would be no impacts to biological resources since no construction would occur. For the proposed action, all activities would be within existing streets in the urbanized setting of Tijuana. Vegetation within the project area is highly disturbed and does not support biological resources.

4.8 CULTURAL RESOURCES AND AESTHETICS

No impacts to cultural resources or aesthetics would occur from the no action alternative. There would also be no impacts to cultural resources or aesthetics from the proposed action since all construction would occur in previously developed roadways.

4.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

There would not be any adverse impacts on socioeconomic or environmental justice communities from the no action alternative and the proposed project. The proposed project would eliminate leaks of raw sewage from the wastewater collection main, which would provide a positive impact to the community within the project area.

4.10 MUNICIPAL SERVICES

Under the no action alternative, there continues to be a risk to human health and the environment of exposure to raw sewage from failing wastewater collection lines.

Short-term impacts on municipal services from the proposed project would be related to minor traffic disruption in Mexico during work on roadways and within easements. There would be no transboundary effects on municipal services for this alternative. Under the proposed alternative, provisions will be made to maintain wastewater collection service to residents within the project area during construction. There would be no effects to energy or waste management.

4.11 PUBLIC HEALTH AND SAFETY

Without an adequate wastewater collection system in Tijuana, exposure to raw wastewater would continue to occur. This exposure negatively impacts public health in Tijuana as exposure to raw sewage on streets or in surface waters is a pertinent public health risk. Due to the frequency of U.S./Mexico border crossing, the public health in the U.S. is also at risk under the no action alternative, although any potential public health effects directly linked to wastewater from the project collector lines would be a less than significant impact.

By continuing to use deteriorated collector lines and manholes, a risk of roadway, manhole or collector collapse would continue. These events, though infrequent, pose a serious risk of damage to vehicles and are general public safety risk in Mexico.

Public health in Tijuana would be positively affected by the proposed alternative since the alternative has the potential to eliminate exposure to raw sewage from the overflow of collection lines. The overall improvement of sanitary conditions within the project area would promote better overall public health conditions and further provide transboundary benefits by reducing health risks within the immediate area of the border due to the frequency of U.S./Mexico border crossing.

4.12 Cumulative Effects

CEQ defines cumulative impacts as an “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

The proposed action would rehabilitate or replace 5.5 miles (8.9 kilometers) of collector lines with diameters ranging from 8 to 42 inches (20 to 107 centimeters) and rehabilitate approximately 37 manholes and construct an additional 10. These improvements are expected to generate positive cumulative impacts on both side of the border, since water quality within the Tijuana River Watershed will be improved. The proposed project is expected to reduce potential risks to human health and the environment, as well as improve aesthetic conditions within Tijuana by reducing odors.