EXPANSION OF THE WASTEWATER TREATMENT PLANT ROSARITO I IN PLAYAS DE ROSARITO, BAJA CALIFORNIA

TRANSBOUNDARY ENVIRONMENTAL ASSESSMENT

March, 2009

Prepared for:

Comisión Estatal de Servicios Públicos de Tijuana
Border Environment Cooperation Commission
U.S Environmental Protection Agency

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Environmental Protection Agency (EPA) administers the Border Environmental Infrastructure Fund (BEIF), which provides grant funding for water and wastewater infrastructure projects within 100 kilometers (km) of the international boundary between the United States (U.S.) and Mexico. EPA policy for use of border infrastructure funds requires the 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 both EPA National Environmental Policy Act (NEPA) regulations, as well as Mexican environmental regulations.

The purpose of this document is to comply with NEPA documentation requirements for the proposed federal action under consideration, which consists of expanding the public Rosarito I Wastewater Treatment Plant (WWTP) for the City of Playas de Rosarito, State of Baja California, Mexico.

1.1.1 Legal Framework

EPA has determined that it will follow the NEPA and EPA regulations for environmental impacts in the U.S. from projects located in the U.S. or Mexico. The EPA follows the U.S. Agency for International Development (AID) approach as summarized in Title 22 CFR Part 216.1-216.10 as guidance for assessing environmental impacts in Mexico. The AID regulations envision collaboration with affected countries to the maximum extent practicable in developing an EA. AID regulations authorize use of either a study prepared by an international body in which the U.S. is a participant, or a concise review of the relevant environmental issues, with appropriate documentation, as a substitute for an EA.

This EA was prepared using Council of Environmental Quality (CEQ) regulations 40 CFR Parts 1500-1508 and EPA regulations (40 CFR Part 6) as guidance. This EA documents the environmental consequences in the U.S. of the proposed federal action. Transboundary impacts to the U.S. are included in this EA to satisfy AID regulations pertaining to environmental analysis outside the U.S. In order to evaluate the environmental impacts of the proposed federal action in Mexico, a separate *Manifestación de Impacto Ambiental* (MIA) document was prepared and submitted to the Secretariat of Environment and Natural Resources of Mexico. The project was authorized in the final resolution document file No: DFBC/SGPA/UGA/DIRA/3468/05 issued on February 14th, 2006.

This EA is extensively based on information contained in the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM, 2003); the Environmental Assessment for the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM, 2003), and; the *Manifestación de Impacto Ambiental* (CDM, 2003) prepared for the Master Plan to comply with environmental review requirements of the SPA (former Baja California State Ecology Department). Additional information was obtained from previous environmental impact statements and other sources, as referenced. A description of the project alternatives was provided by the Commisión Estatal de Servicios Públicos de Tijuana (CESPT), including projected flows, and wastewater treatment and effluent disposal methods.

Potential adverse and beneficial environmental impacts of several action alternatives, as well as the "no action" alternative are described in the EA. The document was prepared in general accordance with the BEIF Environmental Assessment Guidelines developed by BECC. It includes an evaluation of current conditions, and potential impacts including, but not limited to, near-term, long-term and cumulative. The main objective of this document is to describe transboundary impacts (i.e., impacts in the United States) associated with the alternatives evaluated in the planning documents previously described, although reference is also made to potential impacts in Mexico to the extent that they may influence effects in the U.S.

1.2 PROJECT LOCATION AND AREA OF CONCERN

The City of Rosarito is located in the northwestern part of the State of Baja California, Mexico, approximately 13 miles south of the U.S./Mexico border, adjacent to the Pacific Ocean. It serves as a municipal seat of the Playas de Rosarito Municipality in the state of Baja California. The City of Rosarito is bordered to the north and east by the municipality of Tijuana; to the south by the municipality of Ensenada; and by the Pacific Ocean to the west (Figure 1-1 – Location Map).

According to 2008 projections from the population council of Baja California (CONEPO, by its initials in Spanish), the municipality of Playas de Rosarito had a population of 83,433 residents[1] (Figure 1-2 – Project Area Setting). The proposed action would provide wastewater service to the communities within the Playas de Rosarito municipality that are located approximately 13 miles (21 km) south of the U.S-Mexico international border.

The study area for this EA is defined as the areas in the United States adjacent to the border that may be adversely affected by the proposed projects in Mexico. BECC guidelines state that special attention should be paid to areas within a 6-mile radius of the proposed project. In this case, the area of concern is extended beyond the six-mile radius in order to examine impacts in the United States. Figures 1-2 and 1-3 shows the locations of the proposed projects in relation to the areas of concern (Figure 1-3 – Area of Concern).

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The "Comisión Estatal de Servicios Públicos de Tijuana" (CESPT) is the Baja State Utility responsible for providing water and sanitation service to the municipality of Playas de Rosarito. CESPT officials have determined that infrastructure improvements are required to address wastewater treatment system deficiencies and for compliance with federal and state regulatory requirements.

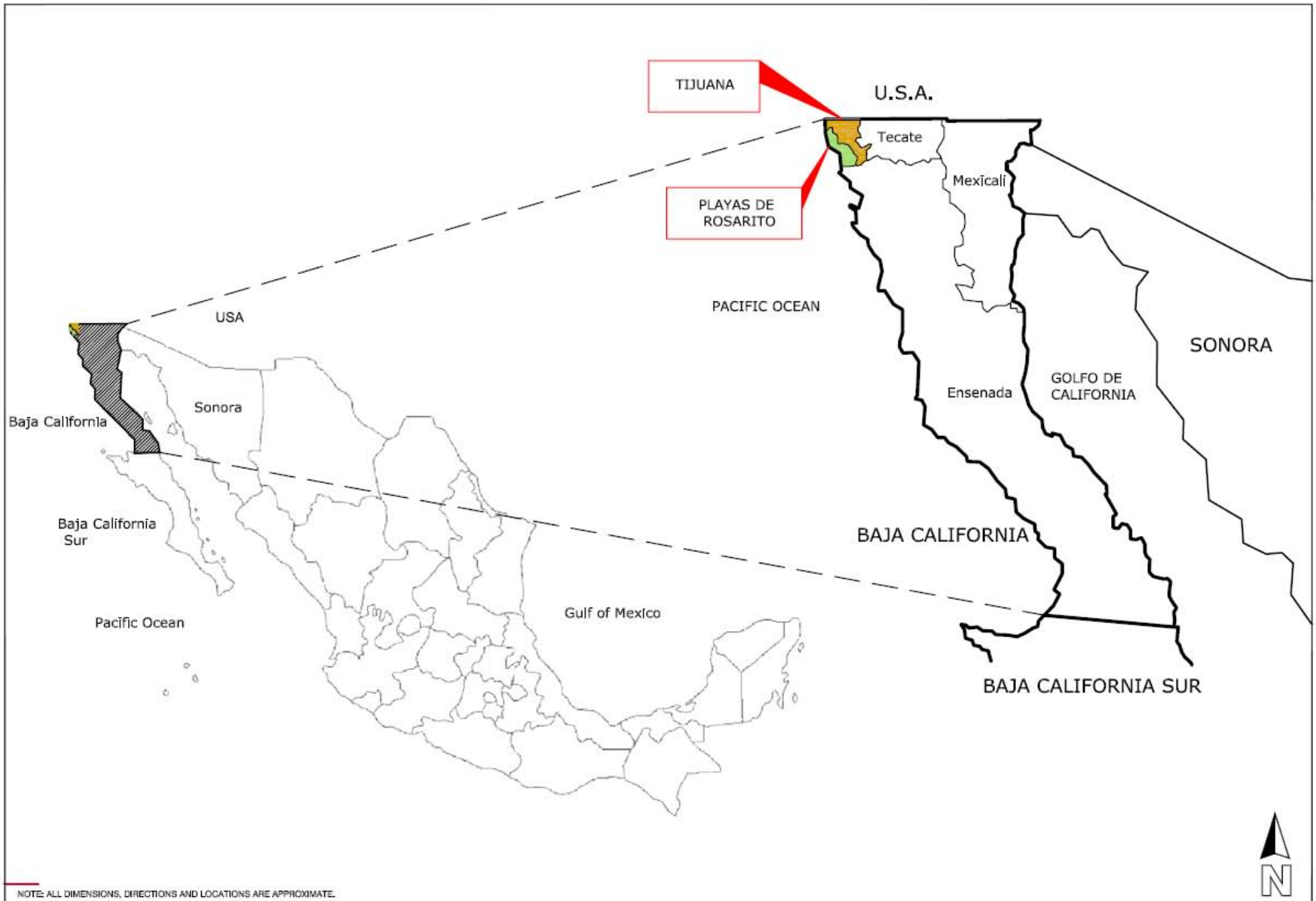
CESPT is seeking certification from BECC for the City to double the capacity of the Rosarito I WWTP in order to provide wastewater treatment capabilities to areas in Rosarito that are not currently served. CESPT will seek funding from various agencies such as the Comisión Nacional del Agua (CONAGUA, formerly known as CNA) and the Border Environment Infrastructure Fund (BEIF) to fund this project.

BECC certification is required to become eligible for funding from the BEIF administered by the North American Development Bank (NADB). The purpose of the proposed action is to address environmental and public health risks associated with inadequate collection, treatment and disposal of wastewater.

The proposed expansion of the existing Rosarito I WWTP will address environmental and public health risks associated with inadequate collection, treatment and disposal of wastewater by eliminating untreated sewage discharges in areas of Rosarito that are not currently served nor connected to a wastewater treatment facility. The proposed action will significantly reduce or eliminate inappropriate wastewater disposal, resulting in improved environmental and sanitation conditions.

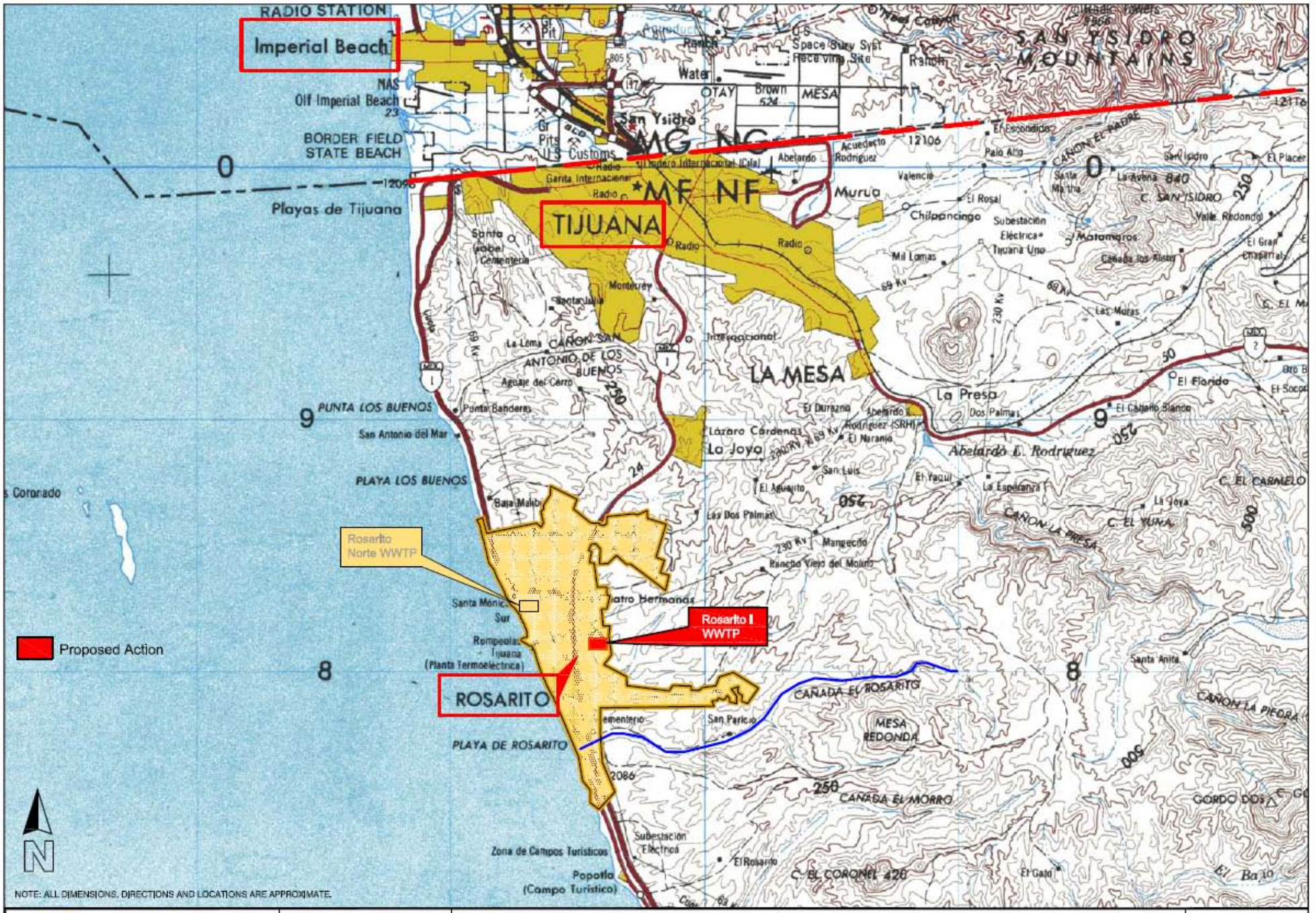
A Preliminary Engineering Report (PER) identified and evaluated three alternatives for improving and expanding the existing Rosarito I WWTP. The alternatives considered the expansion of the existing facility by the construction of a new 60 lps module in order to increase the treatment capacity to 120 lps. Such alternatives will be described in more detail in Section 2 of this document.

[1] Consejo Estatal de Población del Estado de Baja California, Indicadores Estratégicos, Junio 2008.

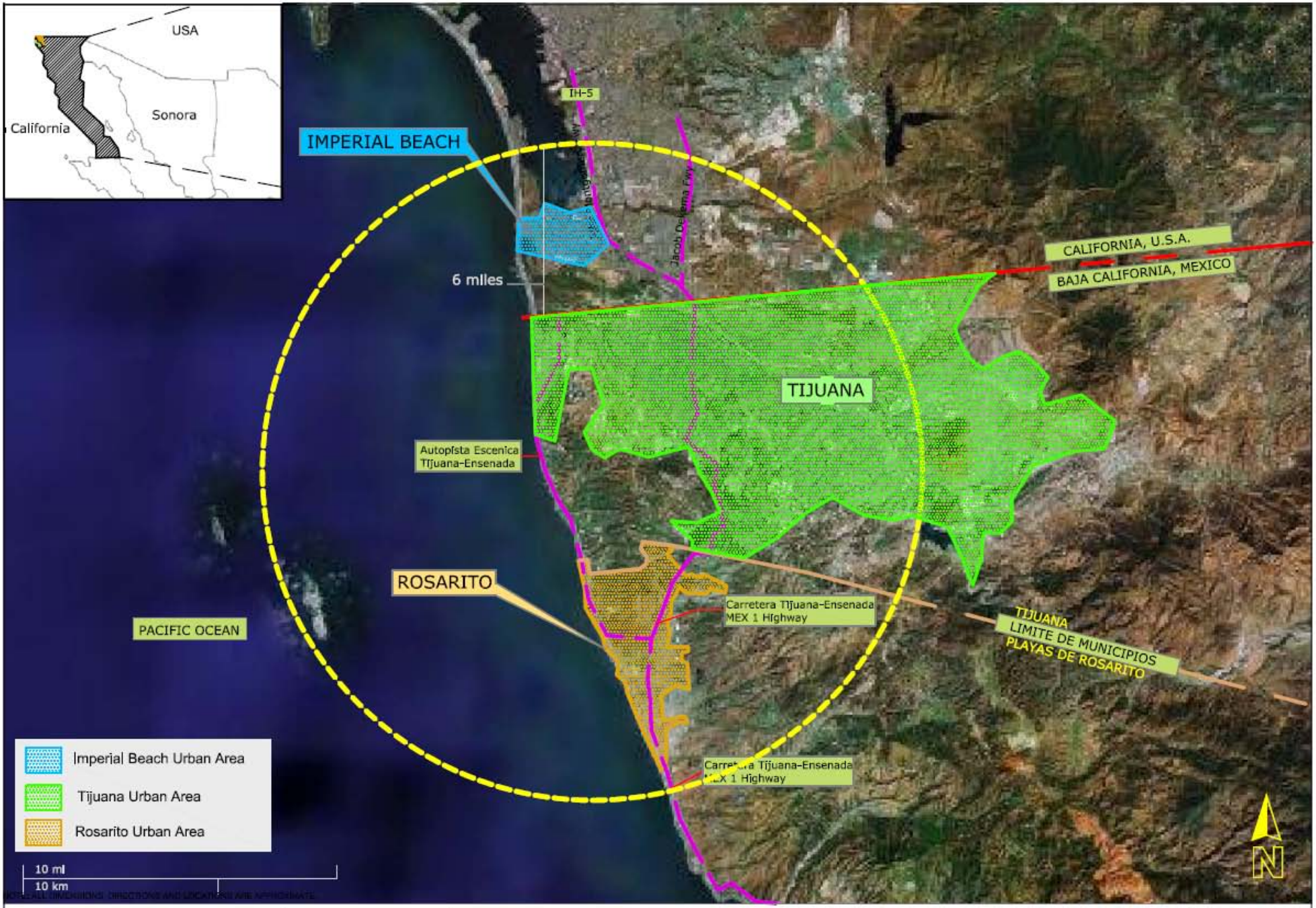


NOTE: ALL DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	DATE 10/03/08	LOCATION MAP	FIGURE 1-1
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	



Ninyo & Moore	DATE 10/03/08	PROJECT AREA SETTING	FIGURE 1-2
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	



Ninyo & Moore	DATE 10/03/08	AREA OF CONCERN	FIGURE 1-3
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Collection System to Unserved Areas in the Cities of Tijuana and Playas de Rosarito, Baja California	

The existing Rosarito I wastewater treatment process includes an Extended Aeration/Activated Sludge (EA/AS) treatment system, which consists of pre-treatment unit, an aerobic reactor (two aerated lagoons), a secondary clarifier, a sludge digester and a sludge drying unit. The plant provides a total treatment capacity of approximately 1.4 mgd (60 lps) and discharges into the Arroyo Huahuatay where the effluent is conveyed to the Pacific Ocean for final disposal through an ocean outfall. This outfall is located 13.5 miles (22 km) south of the international border and extends approximately 1640 ft (500 m) offshore.

The Rosarito 1 treatment plant serves nearly 34,500 residents (8,370 hookups) and it is currently working over capacity 1.6 mgd (68 lps). It is therefore unable to serve new areas that are being connected to the wastewater collection system. As a result of the expansion of the sewer system, currently under construction through non-BEIF sources, approximately 4053 new connections will be installed to service 16,698 residents. These connections, which will generate a total estimated wastewater flow of 0.8 mgd (34 lps), will need to be treated at the Rosarito I WWTP. Therefore, according to CESPT's calculations, an additional capacity of at least 1 mgd (44 lps) will be required to accommodate the existing and upcoming flows. The proposed project will benefit in total approximately 21,802 residents by providing additional capacity to the Rosarito I WWTP.

Throughout the past 30 years, the border region between the United States (U.S.) and Mexico has experienced a surge in population and industrialization. This growth often exceeded the existing infrastructure, leading to inadequate potable water distribution, wastewater collection, and wastewater treatment.

Human health and environmental impacts associated with the wastewater treatment deficiencies currently existing in Rosarito are summarized below:

- Human health and environmental issues are related to contamination of surface and groundwater. Cesspools on individual lots allow wastewater to flow into to ditches and low-lying areas where surface water collects. As a result, the potential for contact by area residents is high.

- Due to a lack of wastewater collection and treatment systems throughout the city of Rosarito, a large number of cesspools exist that can contaminate groundwater.

- The low income of the residents prohibits frequent maintenance of the cesspools. (Operation and maintenance costs for the existing systems include cesspool pumping, wastewater transportation and treatment.)

- With the existing shallow water table and high density of on-site disposal systems, continuing population growth will exacerbate the potential for groundwater contamination.

1.4 SCOPE OF THE TRANSBOUNDARY ENVIRONMENTAL ASSESSMENT

The purpose of this EA is to document and make public the potential transboundary environmental impacts that may arise from the implementation of the proposed action, the no action, or any other action alternative considered by CESPT for the expansion of the Rosarito I WWTP. As defined in CEQ regulations (§ 1508.25), the scope of this EA is limited to the transboundary environmental resources and services within the area of interest in the U.S. that may be affected by the no action alternative or one of the action alternatives. This EA was prepared following the scope of work presented under BECC's "BEIF Environmental Assessment Guidelines" for Mexican environmental infrastructure projects for which BEIF funding is sought. The organization of this document follows that established by the BECC scope of work.

The following general topics are included in the scope of this EA:

- Description of Alternatives
- Environmental Setting
- Transboundary Impacts Analysis
- Cumulative Impacts Analysis

1.4.1 Relevant Environmental Issues

In accordance with CEQ regulations (§ 1500.4 and § 1501.7) and BECC-BEIF environmental requirements, issues to be addressed relating to this proposal are land use, air quality, water resources, biological resources, cultural resources, noise, socio-economic and public health conditions and cumulative effects. Specific attention is given to non-land based issues, such as air and water, and to resources where there may be project-induced effects, such as public health and socio-economic resources.

Environmental issues relevant to all alternatives, including the preferred alternative, are discussed in greater detail in Section 3. Environmental issues not relevant to the project are not discussed beyond this section, or are covered in minimal detail. Environmental issues and resources are identified as relevant or not relevant based on the possibility of any of the alternatives affecting that particular issue or resource.

The following list of environmental issues was initially considered for inclusion in the detailed evaluation:

- Land Use
- Noise
- Public Health
- Air Quality and Climate
- Cultural Resources
- Socio-economics
- Biological Resources
- Water Resources
- Surface Water
- Pacific Ocean
- Groundwater
- Coastal Resources

The construction for the proposed action would occur in Mexico. Construction activities could generate noise and air quality emissions that could potentially affect the U.S. Any construction within Mexico could affect historic or cultural resources in the immediate vicinity of the project. However, all construction would occur along existing disturbed areas in Mexico, furthermore, if previously unidentified cultural resources are discovered during the project activities, the contractor will stop working immediately at the location and the proper municipal or state authorities as well as the Instituto Nacional de Antropología e Historia (INAH) will be contacted.

Any hazardous or solid waste existing in the study area, produced or found during project construction would not affect the U.S. territory. All waste would remain, be handled, and disposed of in Mexico, according to applicable Mexican regulations. Although considered for detailed study, land use in Mexico will not be affected because all of the construction activity would take place on previously disturbed land and mostly along streets. The project would not affect land use in the U.S.

Project activities would take place approximately 13 miles away from the U.S., therefore, there would not be any odor impacts in the U.S. caused by the project implementation. In Mexico, the implementation of

the proposed actions would provide service to residences lacking connection to the wastewater treatment system, thereby eliminating odor and wastewater disposal problems for local residents.

The alternatives could affect surface water and groundwater resources by either ground seepage and/or wastewater discharges to any of the intermittent rivers (Arroyo Huahuatay and Arroyo Reforma) or ephemeral washes in Playas de Rosarito. The alternatives could affect surface water quality by the quality and quantity of wastewater discharged to the Pacific Ocean. Changes in coastal water quality could indirectly affect biological and coastal resources in the U.S. If water quality along U.S. beaches changes, the public health of swimmers and beach-goers could be affected. Additionally, if beaches are closed for public health reasons, recreation and tourism industries could be affected. The project would improve public health in Mexico, and because of frequent border crossings, this could reduce potential health threats to the U.S. The U.S. border region shares close economic ties with the Tijuana region. This border economy could improve if the proposed action is implemented. Environmental justice in the U.S. would not be an issue because construction activities that could affect low income and minority populations would not occur within the U.S. Terrestrial biological resources would not be directly affected because of the distance of the projects to the U.S.

The Rosarito River valley groundwater basin is recharged by the Rosarito River, Las Palmas River and Descanso River particularly in areas outside of the city of Rosarito. Groundwater impacts in Mexico are not anticipated. The proposed alternatives may provide benefits to groundwater by reducing or eliminating the discharge of wastewater to the environment. Project activities would take place approximately 13 miles away from the U.S., therefore, Groundwater impacts in the United States are not anticipated.

Construction activities would not affect biological resources because these activities would take place in previously disturbed areas. Biological resources in the U.S. could potentially be slightly affected by changes in ocean water quality; in case considerable amounts of untreated wastewater effluent makes it to the Pacific Ocean. The alternatives would not affect national landmarks, wetlands, floodplains, as well as wild and scenic rivers because of their distance from the projects. Coastal resources in the U.S. could be indirectly affected by construction activities and wastewater discharges in Mexico.

In summary, land use, air quality, water resources, biological resources, cultural resources, noise, socioeconomics, and public health may be relevant environmental issues linked to the alternatives evaluation, and are assessed in greater detail in this EA.

1.4.2 Issues Eliminated from Detailed Study

Odor, floodplains, wetlands, farmlands, national landmarks, scenic rivers, environmental justice, hazardous and solid waste, and municipal services are not relevant environmental issues in the study area with respect to the evaluated alternatives. They have therefore been excluded from additional evaluation.

2.0 PROJECT DESCRIPTION AND ALTERNATIVES

In accordance with CEQ regulations (§ 1502.14), this section of the EA evaluates all alternatives, including alternatives that were eliminated from detailed study and the reasons for elimination with substantial discussion of each alternative to include any potential environmental impacts and appropriate mitigation measures.

The proposed treatment system expansion improvements will be installed to provide treatment coverage to areas of the City that are being connected to the wastewater collection system, these areas currently lack adequate wastewater collection and treatment service and rely on open ditches or latrines for their wastewater disposal needs. Approximately 21,802 residents would benefit from this project.

2.1 DESCRIPTION OF THE PROPOSED ACTION

The proposed action consists of the expansion of the Rosarito I Wastewater Treatment Plant located in Playas de Rosarito in order to increase treatment capacity from 60 lps to 120 lps. This expansion will alleviate capacity issues and provide service to areas of the City that are being connected to the wastewater collection system.

The existing Rosarito I wastewater treatment process includes an Extended Aeration/Activated Sludge (EA/AS) treatment system, which consists of pre-treatment unit, an aerobic reactor (two aerated lagoons), a secondary clarifier, a sludge digester and a sludge drying unit. The plant was originally designed to handle a total volume of 35 lps (0.84 MGD). Due to insufficient capacity to provide wastewater services to Rosarito residents, the Rosarito I WWTP was upgraded and expanded in 2005/2006 from 35 lps to 60 lps. Treated effluent from the plant discharges into the Arroyo Huahuatay where it is then conveyed to the Pacific Ocean for final disposal through an ocean outfall approximately 13.5 (22 km) south of the international border. The outfall extends approximately 1640 ft (500 m) into the ocean and is 12 meters deep. It has a capacity of 3.4 mgd (150 lps). The entire creek discharges out the ocean outfall.

Currently, this treatment plant is working over capacity 1.6 mgd (68 lps) and is unable to serve new areas that are being connected to the wastewater collection system (non-BEIF projects). Based on CESPT flow projections, additional capacity of 1 mgd (44 lps) is required to accommodate existing and upcoming flows. (See section 1.3).[2]

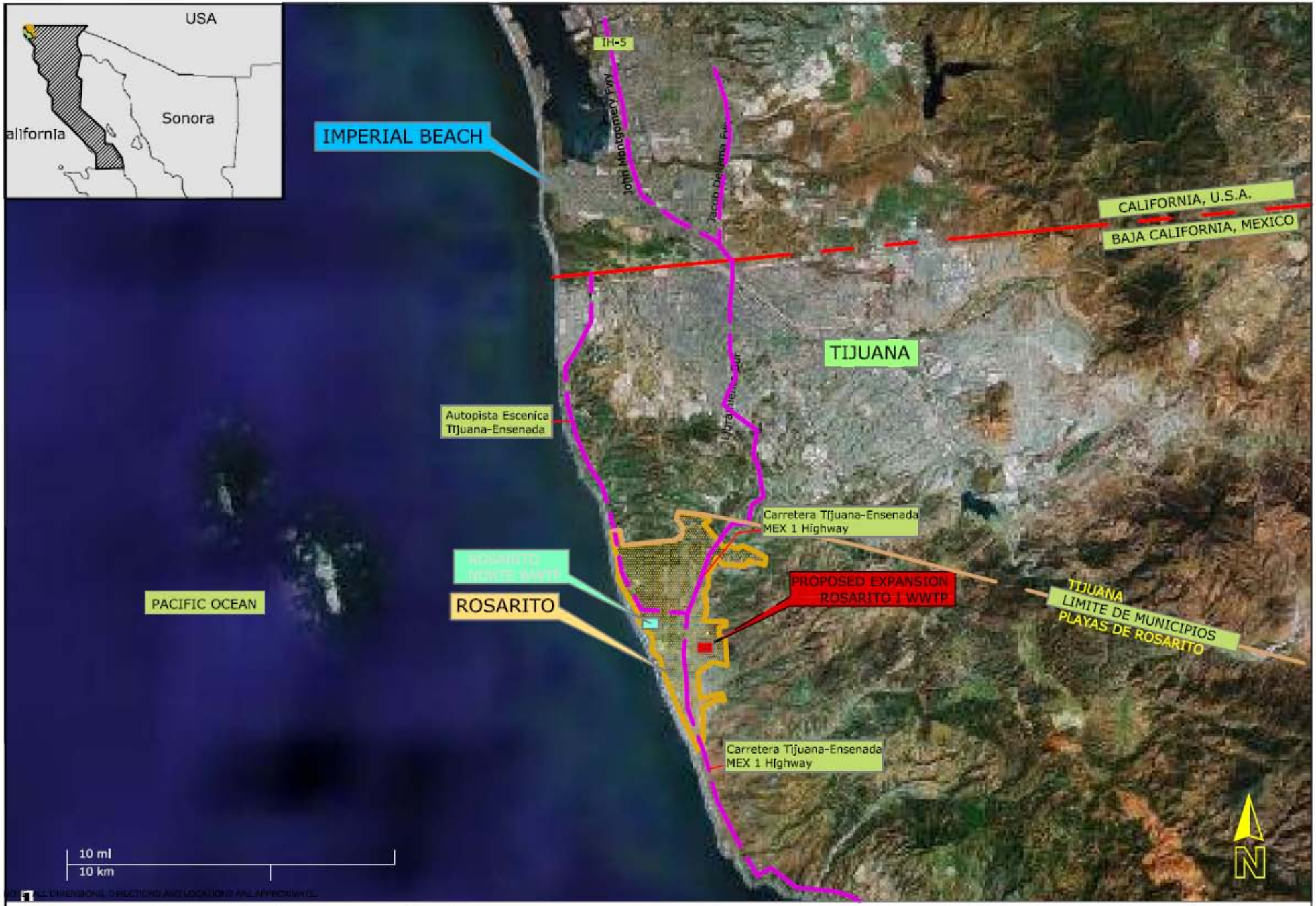
The proposed expansion of the wastewater treatment plant as considered by the CESPT consists of Extended Aeration-Activated Sludge process with different configurations that may or may not include oxidation ditch and a disinfection process either by UV or chlorine.

Improvements to the wastewater treatment system would be implemented following the recommendations of the Preliminary Engineering Report (*PER*) study completed by the CESPT in 2005[3] for the proposed expansion and rehabilitation of the Rosarito I WWTP from 1.4 to 2.8 mgd (60 to 120 lps).

The PER identified and evaluated three alternatives for improving the existing Rosarito I WWTP and developed a preliminary design for expanding the wastewater treatment system. The alternatives considered the expansion of the existing facility by the construction of a new 60 lps module to increase capacity to 120 lps. Such alternatives will be described in more detail ahead in this Section.

[2] Preliminary Engineering Report (PER) – Rehabilitación y Ampliación de la Planta de Tratamiento de Aguas Residuales Rosarito I, (CESPT, 2005) and CESPT Flow Projections, 2008

[3] Preliminary Engineering Report (PER) – Rehabilitación y Ampliación de la Planta de Tratamiento de Aguas Residuales Rosarito I, (CESPT, 2005)



Ninyo & Moore	DATE 10/03/08	SITE LOCATION FOR THE EXISTING ROSARITO I WWTP	FIGURE 2-1
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	

Discharges from the expanded plant would continue through the ocean outfall. In the future, CESPT will attempt to reuse as much of the treated wastewater as possible for landscape irrigation in the "Gran Parque de La Ciudad."

The expected effluent quality for the Rosarito I WWTP would be in compliance with the Mexican Norms: NOM-001-ECOL-1997 for discharges into the Ocean and NOM-003-ECOL-1997 for reclaimed water use for non-potable uses. The following table indicates the permitted discharge limits and the current water quality.

Table 2.0 Rosarito I discharge limits and current effluent water quality.

Parameter	Units	Average Monthly Limit	Daily Maximum Limit	Actual median effluent value from January to September 2008
Biochemical Oxygen Demand (BOD)	mg/l	30	150	8
Oil and Grease	mg/l	15	25	4
Fecal Coliform	MPN/100ml	1000	2000	30
Total Suspended Solids	mg/l	30	125	24
Settleable Solid	mg/l	1	2	0.1
Floating Matter	mg/l	Not present	Not present	N/A
Temp	°C	40	40	21
pH	Units	5-10	5-11	8
Phopshorous	mg/l	20	30	4
Nitrogen	mg/l	40	60	28
Arsenic	mg/l	0.1	0.2	N/A
Cadmium	mg/l	0.1	0.2	N/A
Cyanide	mg/l	1	2	N/A
Copper	mg/l	4	6	N/A
Chromium	mg/l	0.5	1	N/A
Mercury	mg/l	0.005	0.01	N/A
Nickel	mg/l	2	4	N/A
Lead	mg/l	0.2	0.4	N/A
Zinc	mg/l	10	20	N/A

Currently, the sludge (solids) generated by all treatment plants operated by CESPT, as well as the sludge generated at the South Bay International Treatment Plant in San Diego are being disposed at a location called Punta Bandera, approximately 4.2 miles (6.8 km) south of the international border. The site started operation in 2001. This facility has a surface area of approximately 400,000 m^2 , and includes 8 sludge monofill disposal cells with a disposal capacity of 23,726 m^3/year (dry base) each. Prior to final disposal the sludge is subject to a drying process where it loses up 30% of its humidity, (the sludge typically arrives with 60-70% humidity). During 2008, this facility received approximately 34,368 m^3 of wet sludge that was reduced to approximately 12,274 m^3. [4] Sludge volumes generated by the Rosarito I WWTP in 2007 and 2008 were 700 m^3, and 1704 m^3 respectively. The sludge will continue to be disposed at Punta Bandera, including additional volumes generated by the proposed project.

The increase in sludge is not expected to have environmental impacts since according to generation projections, calculated by the project sponsor, the current facilities will have enough capacity for the next 20 years to receive digested sludge generated by the south bay IWTP and all the treatment plants operated

[4] CESPT, WW Treatment Department.

by CESPT in Tijuana and Playas de Rosarito. Also, a feasibility study to reuse digested sludge was developed by the project sponsor and alternatives are being studied.

2.2 EXISTING WASTEWATER TREATMENT INFRASTRUCTURE

In addition to the wastewater treatment plant, Rosarito I, described above, there is another wastewater treatment plant in Rosarito referred to as "Rosarito Norte." This plant is located approximately 11 miles south of the U.S.-Mexico border in the northwest corner of the City of Rosarito and includes an extended aeration/activated sludge treatment process (EA/AS) with an oxidation ditch system, within a total area of 5 hectares (12.3-acres). The WWTP has capacity to treat up to 210 lps (4.79 MGD).

Currently Rosarito Norte WWTP is treating an average flow of 38 lps (0.8 MGD) and has treatment capacity to accommodate additional flows resulted from the expansion of the wastewater collection system in the northern sector of Rosarito. Around 7 lps (0.15 MGD) of the treated effluent is being reused for landscape irrigation in the neighboring areas. The remainder is discharged into the "Arroyo Reforma" and flows 200 meters before reaching the Pacific Ocean approximately at 11.5 miles south from the border. New service connections to the Rosarito Norte plant are currently being considered. The impacts from these connections are analyzed in a separate Environmental Assessment.

2.3 ALTERNATIVE 1 – NO ACTION

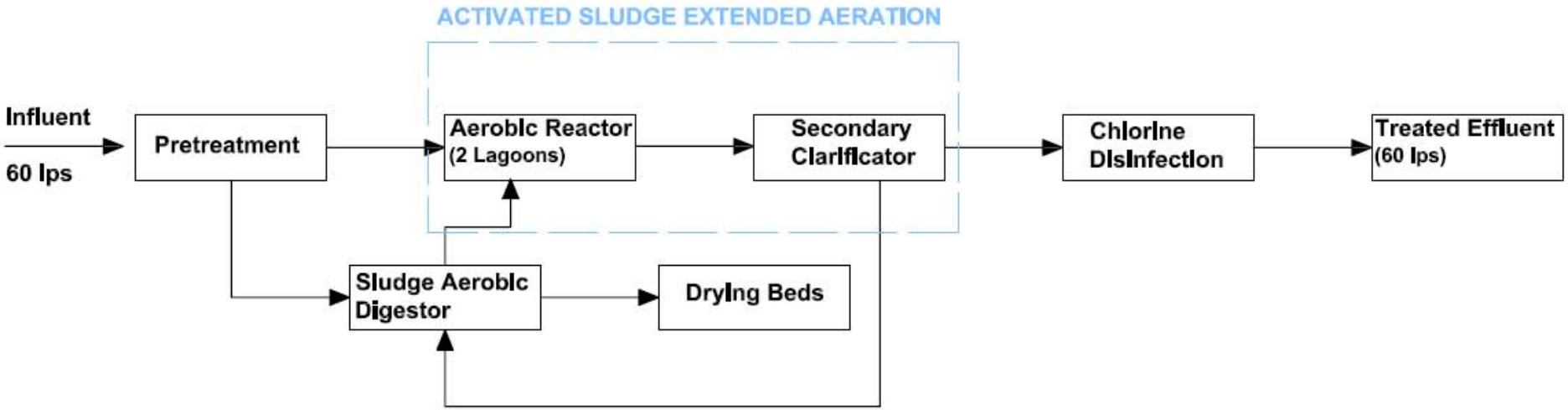
Under the No Action Alternative, proposed expansion to the existing wastewater treatment system would not be completed and flows in the Rosarito I WWTP would continue to exceed treatment capacity.

Conditions in the wastewater treatment system would decline because of the expected increase in population and/or additional wastewater flows. These flows would be diverted to the adjacent waterbody (Arroyo Huahuatay) to alleviate excess wastewater intakes that would not be treated due to lack of treatment capacity. (Figure 2-2 – No Action Alternative).

Water quality in the Arroyo Huahuatay and in the Pacific Ocean would continue to decrease, because of the projected increase in population and resulting increases of untreated sewage. Aquatic communities in the Pacific Ocean may decline if water quality decreases. Furthermore, the bacteriological quality of the ocean waters may be affected in U.S. waters by means of marine currents that could carry these pathogens northward[5]. Ocean currents close to the area of concern typically experience a south flow regime, although there are some exceptions in which the ocean currents flow northward or overall weak current conditions cause a plume to spread in both directions (Ocean Imaging, 2002).

Groundwater within the area of concern could become contaminated because of continued use of malfunctioning septic systems and cesspools for wastewater disposal due to insufficient treatment capacity. The City of Rosarito would continue with an unreliable wastewater treatment system without the capacity necessary to properly meet the wastewater treatment needs of the entire population and to comply with the minimum standards for wastewater treatment.

[5] Shore and Ocean Discharge Modeling Report, Prepared for the IBWC and EPA by Parsons (October, 2004)



Ninyo & Moore	DATE 10/03/08	ALTERNATIVE 1-NO ACTION Existing 60 lps Activated Sludge/Extended Aeration WWTP Rosarito I	FIGURE 2-2
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	

2.4 ALTERNATIVE 2 – EXTENDED AERATION/ACTIVATED SLUDGE (EA/AS) PROCESS AND OXIDATION DITCH (PREFERRED)

Proposed Action Alternative 2 would expand treatment capacity of the Rosario I WWTP from 60 lps to 120 lps and will provide secondary treatment by means of biological/mechanical processes through an EA/AS process, including an "Oxidation Ditch." The oxidation ditch-type aerobic digester (reactor) is designed to reach a complete mixture and avoid un-mixed areas in the biological reactor (Figure 2-3 – Extended Aeration/Activated Sludge Process including an Oxidation Ditch and UV disinfection).

In an EA/AS process, wastewater is fed continuously into an aerated tank, where the microorganisms metabolize and biologically flocculate the organics. Once the organic matter is transformed into a more stable material then is separated in the settling tank (secondary clarifier).

Alternative 2 disinfection processes include an ultraviolet (UV) unit. The treated wastewater coming from the secondary clarifier will advance to a "disinfection chamber" to expose pathogen microorganisms to the UV emissions, constantly maintaining the flow and exposure time parameters. The sludge stabilization process consists of an aerobic digester and centrifuge dewatering system.

Action Alternative 2 consists of the following summarized processes and equipment:

Pretreatment

- Pretreatment equipment for solids removal, lift station, storage tanks, sedimentation tank, dewatering by centrifugation with capacity to remove up to 25% of the water and odor control system

Treatment

- Coarse screen and grit removal unit
- Aeration tank, clarifier, and UV disinfection
- Sludge processing consisting of aerobic digesters, coagulation and dewatering by centrifugation

2.5 ALTERNATIVE 3 – EXTENDED AERATION/ACTIVATED SLUDGE (EA/AS) CONVENTIONAL PROCESS

Proposed Action Alternative 3 would double treatment capacity of the existing WWTP from 60 lps to 120 lps and will provide secondary treatment by means of biological/mechanical processes through a conventional EA/AS process (Figure 2-4 – Extended Aeration/Activated Sludge Conventional Process).

In an EA/AS process, wastewater is fed continuously into an aerated tank, where the microorganisms metabolize and biologically flocculate the organics. Once the organic matter is transformed into a more stable material then is separated in the settling tank (secondary clarifier). Alternative 3 proposes chlorination as disinfection method before treated effluent is discharged into the Huahuatay creek.

Action Alternative 3 consists of the following summarized proposed processes and equipment:

Pretreatment

- Pretreatment equipment for solids removal, lift station, and storage tanks, as well as a dewatering box with the capacity to remove up to 12-15% of the water

Treatment

- Coarse screen and grit removal unit
- Aeration tank, clarifier and chlorination
- Sludge processing which consists of aerobic digesters, coagulation, and dewatering box

2.6 ALTERNATIVE 4 – EXTENDED AERATION/ACTIVATED SLUDGE (EA/AS) PROCESS AND OXIDATION DITCH (CHLORINE DISINFECTION)

Proposed Alternative 4 is similar to proposed Alternative 2, as both include an EA/AS process with oxidation ditch. The difference between the two alternatives is the disinfection process since alternative 4 includes a chlorine disinfection unit (Figure 2-5 – Extended Aeration/Activated Sludge Process including an Oxidation Ditch and Chlorine disinfection).

Action Alternative 4 consists of the following summarized proposed processes and equipment:

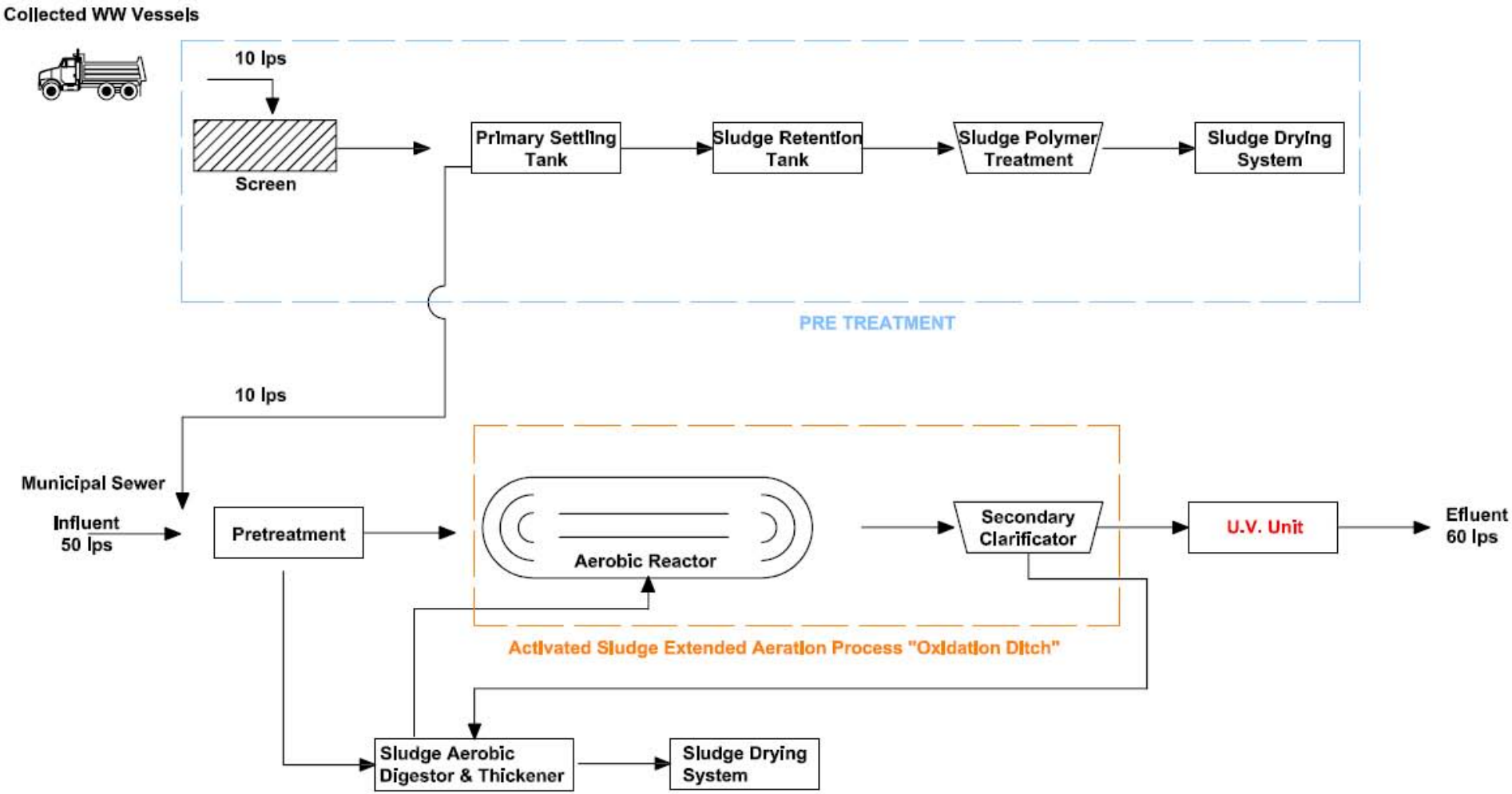
Pretreatment

- Pretreatment equipment for solids removal, lift station, storage tanks, sedimentation tank, dewatering by centrifugation with the capacity to remove up to 25% of the water and odor control system

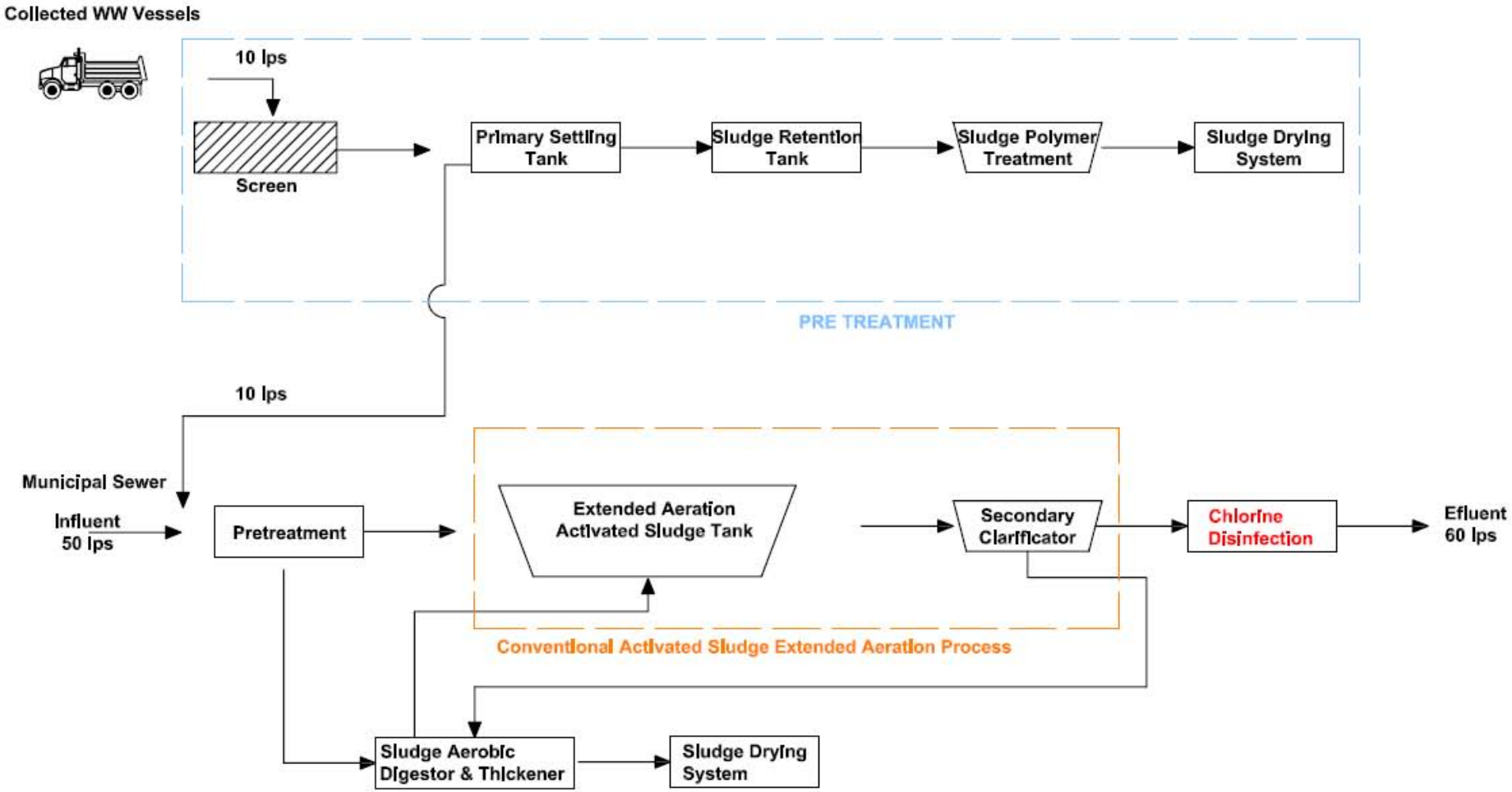
Treatment

- Coarse screen and grit removal unit
- Aeration tank, clarifier and existing disinfection system (chlorination)
- Sludge processing consisting of aerobic digesters, and dewatering by centrifugation

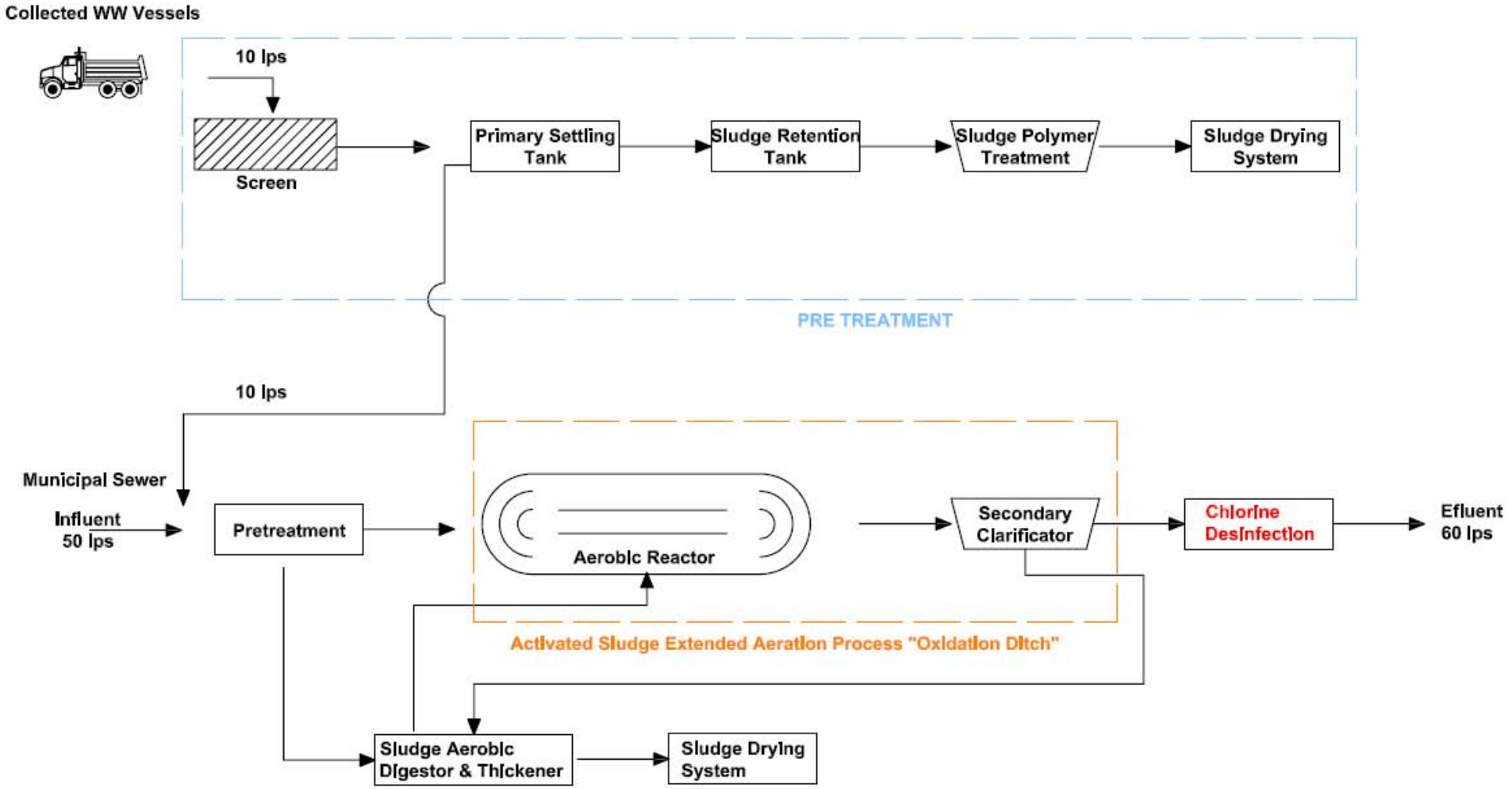
Action Alternatives 2, 3, and 4 will double the wastewater treatment capacity from 60 lps to 120 lps and will provide secondary treatment by means of biological/mechanical processes through an EA/AS process technology. The EA/AS process differs among the three alternatives for instance, an oxidation ditch is included in Alternatives 2 and 4 while alternative 3 consist of a conventional activated sludge treatment system. In addition, different disinfection processes are proposed; UV for Alternative 2 and Chlorine for Alternative 3 and 4, the alternatives also include other enhancements such as dewatering by centrifugation and odor control system. All of the alternatives are intended to discharge their treated (Action) or untreated (No Action) effluent into the Arroyo Huahuatay approximately 2.7 km away from the ocean. Effluent would be conveyed to the Pacific Ocean for final disposal, thought the ocean outfall which is located 13.5 miles (22 km) south of the international border and extends approximately 1640 ft (500 m) offshore.



Ninyo & Moore	DATE 10/03/08	ALTERNATIVE 2 Extended Aeration / Activated Sludge Process including an Oxidation Ditch and UV disinfection	FIGURE 2-3
BBCC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	



Ninyo & Moore	DATE 10/03/08	ALTERNATIVE 3 Extended Aeration / Activated Sludge Conventional Process	FIGURE 2-4
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	



Ninyo & Moore	DATE 10/03/08	ALTERNATIVE 4 Extended Aeration / Activated Sludge Process Including an Oxidation Ditch and Chlorine disinfection	FIGURE 2-5
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Treatment Plant Rosarito I, in Playas de Rosarito, Baja California	

2.7 COMPARISON OF THE ALTERNATIVES

Table 2-1 compares the operation and treatment advantages and disadvantages of the proposed action alternatives.

	Alternative 1	*Alternative 2 (Preferred)*	*Alternative 3*	*Alternative 4*
Operation	Disadvantages: - The Rosarito I WWTP exceeded capacity in 2006. The existing system would continue operating under the current conditions, resulting in continued contamination throughout the service area. - Portions of the city of Rosarito would continue to operate cesspools and discharge to open ditches. These conditions would continue to degrade, creating increased health hazards and potential contamination of the soils and groundwater. - Over time, conditions in the wastewater treatment system could decline because of the expected increase in population and/or additional wastewater flows that would be diverted to the Arroyo Huahuatay to alleviate excess wastewater intakes that would not be treated due to lack of treatment capacity.	Advantages: - The truck discharges go to a primary sedimentation tank in order to avoid a major accumulation of solids. The dehydration time will be decreased, generating a sludge containing a higher solids percentage. Less sludge will be transferred resulting in transportation savings. - Sludge dehydration will be induced by the use of centrifugal forces, resulting in savings in transportation and sludge storage caused by a major sludge humidity removal.	Advantage: - It uses a simple, easy to operate sludge dehydration method. The percentage of solids throughout the process is the minimum required by the applicable regulations.	Advantages: - The aeration system to be used is commonly known by the operators. There is similar equipment in some of their plants. - It uses a simple, easy to operate sludge dehydration method. The percentage of solids throughout the process is the minimum required by the applicable regulations. Disadvantage: - The volume of sludge produced for dehydration is larger than in Alternative 3, causing higher transportation and storage costs.
Pre-treatment System	Disadvantages: - Although groundwater within the area of concern is not used as potable water, it could become contaminated because of continued use of malfunctioning septic systems and the continued use of cesspools for wastewater disposal due to insufficient treatment capacity of the existing Rosarito I WWTP. The city of Rosarito would	Advantage: - A gas collecting and cleaning system will be used at the discharge and pre-treatment stages, minimizing the impact to nearby residents.	Disadvantages: - The pre-treatment system for waste truck discharges requires a larger storage capacity. - A dehydration system capable of managing a larger amount of sludge is	Disadvantages: - The pre-treatment system for waste truck discharges requires a greater storage capacity and a dehydration system capable of managing a larger amount of sludge. - In addition, operating times

	Alternative 1	*Alternative 2 (Preferred)*	*Alternative 3*	*Alternative 4*
	continue without a reliable wastewater treatment system with the capacity necessary to properly meet entire wastewater treatment population needs and to comply with the minimum standards for wastewater treatment.		also needed.	require operators to pay very close attention, thereby increasing O&M costs.
Secondary Treatment	Disadvantage: - In the No Action Alternative, no Secondary Treatment will be implemented.	Advantage: - For the pre-treatment system, the aeration system provides higher oxygen transference, compared to Alternatives 3 and 4, resulting in lower electrical energy and infrastructure demand.	Disadvantage: - In the secondary treatment, the system proposed for the mixed liquor aeration produces a lower efficiency rate than Alternative 2, causing a greater energy and infrastructure demand.	Disadvantage: - The transference efficiency of the aeration system is smaller than that of Alternatives 2 and 3, demanding more electrical energy and infrastructure.
Disinfection	Disadvantages: • The wastewater flows generated in the area will be discharged untreated into Arroyo Huahuatay, which flows to the Pacific Ocean. • In the long-term, water quality in the Arroyo Huahuatay and further downstream to the Pacific Ocean would continue to decrease. Aquatic communities in the Pacific Ocean may decline if water quality decreases. • Furthermore, the bacteriological quality of the ocean waters may be affected within the area of concern and beyond into U.S. territory/waters by means of marine currents that may carry wastewater pathogens to the north.	Advantage: • Ultraviolet light will be used for disinfection purposes on this alternative. The risk of this system is very small compared o the chlorine disinfection methods.	Disadvantage: The chlorine gas disinfection requires an adequate storage place for tanks, incurring some risk to nearby residents.	Disadvantage: • The chlorine gas disinfection requires an adequate storage place for tanks, incurring some risk to nearby residents.

Table 2-2 compares the monetary and non-monetary estimated costs related with the implementation of the proposed action alternatives and the alternatives carried forward for analysis, including the No Action Alternative.

Table 2-2 Monetary and Non-Monetary Evaluation Matrix for Wastewater Treatment Action Alternatives - Rosarito I WWTP

Evaluation Items	Weight Factor	Alternative 1 No Action		Alternative 2 EA/AS* (UV)		Alternative 3 EA/AS*		Alternative 4 EA/AS* (NaClO)	
		Rate	Subtotal	Rate	Subtotal	Rate	Subtotal	Rate	Subtotal
Monetary Criteria									
Construction Cost	3	1	3	2.5	7.5	2	6	2.5	7.5
O&M Cost	2	1	2	3	6	2.5	5	2	4
Life Cycle Cost	2	1	2	3	6	2.5	5	3	6
Subtotal			**7**		**19.5**		**16**		**17.5**
Non-Monetary Criteria									
Ease of Operation and Maintenance	3	1	3	3	9	3	9	3	9
Sludge generation	2	1	2	3	6	2	4	2	4
Dependability	3	1	3	3	9	2.5	7.5	2.5	7.5
Complexity	3	1	3	3	9	2.5	7.5	3	9
Operator skill level requirements	3	1	3	3	9	3	9	3	9
Impact on:					0				
Groundwater	3	1	3	2.5	7.5	2.5	7.5	2.5	7.5
Surface water	3	1	3	3	9	3	9	3	9
Biological Resources	3	1.5	4.5	3	9	3	9	3	9
Public Health	3	1	3	3	9	2.5	7.5	2.5	7.5
Cumulative Effects	2.5	1	2.5	3	7.5	3	7.5	3	7.5
Subtotal			**30**		**84**		**77.5**		**79**

Weight Factors:
3 - Highly Important
2 - Important
1 - Less Critical

Rate:
3 - Excellent
2 - Good
1 - Not Desirable

Alternative 1 - No Action
Alternative 2 - EA/AS including an Oxidation Ditch and U.V. Disinfection
Alternative 3 - EA/AS Conventional Process
Alternative 4 - EA/AS including an Oxidation Ditch and NaClO Disinfection

**EA/AS = Extended Aeration / Activated Sludge Process*
U.V. = Ultraviolet Disinfection
NaClO = Sodium Hypochloride (Chlorine) Disinfection

2.8 IDENTIFICATION OF PREFERRED ALTERNATIVE

Proposed Action Alternative 2 (Preferred) has more monetary and non-monetary advantages than Action Alternatives 3 and 4; therefore, proposed Action Alternative 2 has been selected as the Agency's (CESPT) preferred alternative to carry out the proposed action.

Preferred Alternative Advantages:

- Less storage and truck discharge costs
- Less cost of sludge transportation to the disposal site
- Less space demand for storage in disposal site
- Higher percentage of solids within the sludge generated during truck discharges and by a depuration of wastewater that is superior to the applicable regulations requirements
  - Primary sludge generated reaches 40.21 m^3/day at 4%.
  - Secondary sludge generated reaches 94.69 m^3/day at 1.2%.

- Less energy and electrical infrastructure demand, caused by a higher efficiency of oxygen transference
- Less risk during the disinfection stage

Table 2-3. Action Alternatives Proposed Sludge Dewatering System Efficiencies

Alternative	Equipment	Solid percentage
2	Dewatering by centrifugation	25% or less
3	Dewatering box	12-15%
4	Dewatering box	12-15%

Table 2-4. Proposed Action Alternatives Energy Consumption Efficiencies

Alternative	Equipment	$Eff_{epo}o$ (lbs O_2/HP.h)	Eff_{epo} (lbs O_2/HP.h)	Nominal Power (HP)	Power (to be installed) HP
2	Westech Landy	3.5	1.67	139.59	150
3	House EHRF Aerator	3.04	1.46	160.79	160
4	Aeromix Tornado	1.9	0.91	257.15	280

Notes: the Constants used for the equipment normalization factor are: α=0.85; b=0.9; C_{sw}=8.25 mg/L; C_L=2 mg/L; C_{ss}=9.17 mg/L; T=18ºC. Resulting in a factor of 0.479
H.P. = Horse Power

2.8.1 Preferred Alternative

The WWTP consists of an "Activated Sludge/Extended Aeration" process, in compliance with the Mexican Norms: NOM-001-ECOL-1997 for discharges into the Ocean and NOM-003-ECOL-1997 for reclaimed water use for non-potable uses.

An additional treatment capacity of 60 lps would be available if the proposed action were implemented. Effluent would consist of residential sanitary wastewater from the Playas de Rosarito Municipality. The total wastewater treatment capacity of the Rosarito I WWTP would average 120 lps with implementation of the proposed action. Preferred Alternative's Process Units include the following components:

Influent (by-pass) canal
The influent canal (by-pass) will receive Rosarito's municipality collected wastewater, and protect the WWTP from hydraulic overloads produced during wet-weather. This bypass canal would assure the influent exceeding the wet-weather capacity of the WWTP would be diverted into the Arroyo Huahuatay, thereby protecting the mechanical and operational integrity of the plant.

Pre-treatment (Municipal trucks wastewater discharge)
After collecting wastewater from local septic tanks and latrines, trucks will discharge collected wastewater at the pre-treatment stage. These discharges contain large quantities of solid matter and produce unpleasant odors; therefore, a primary treatment is suggested before the secondary treatment to eliminate odors and some of the solids, avoiding accumulation in the biological treatment units.

The pre-treatment unit would be designed to receive two wastewater truck discharges simultaneously. The wastewater discharges would flow to a reception canal that would take the wastewater effluent to the primary sedimentation tank, where large solids, such as sands, would be separated to generate a clarified pre-treated effluent. The pre-treated effluent would be directed to the aerobic digester (or reactor) to begin biological treatment.

An odor control system would be installed, to prevent fugitive gases from spreading to nearby areas, and causing a potential health impact to nearby residents. The gases producing these odors would be conducted to the control system through a duct. The system would continue to use hypochlorite as a disinfectant agent.

The produced primary sludge would be transferred to a storage tank before being sent to the dehydration process, avoiding the generation of unpleasant odors. During this transfer, polymeric flocculants will be added to assist the dehydration process.

Pre-treatment (Municipal wastewater discharge)
Similar to the Phase I pre-treatment unit, a bar screen would retain large solids, preventing access to floating material, avoiding damage to the equipment and solids accumulation in further stages. The retained solids would be manually removed and disposed of by an operator.

The wastewater would continue to flow to a small solids separator, where the solid matter is mechanically collected and sent to a container. It would then flow through a vortex type sand remover, which helps prevent possible damage to the equipment by avoiding sand accumulation in the treatment units.

These consecutive operations for small solids and sand removal would allow the WWTP electromechanical equipment to operate more efficiently and prevent excessive wear in the mechanisms. Once the treatment stage is completed, the wastewater would flow to the secondary treatment stage via gravity.

Secondary Treatment
Aerobic Digester (Reactor)
The main objective at this point is to prevent the BOD_5 (present in the wastewater) from dissolving. This is achieved by aerobic microorganisms' activity, oxygen injection by aeration systems, and a complete mix of the aerobic digester content.

Through biodegradation and flocculation, the biodegradable organic matter is transformed into a biologically more stable material and separated in the sedimentation tank (secondary clarifier).

The EA/AS process would be implemented, along with a denitrification stage that would be controlled by a PLC (programmable logic controller) and dissolved-oxygen sensors. The advantages of this system are:

- Reduction of air volume to achieve nitrification and BOD_5 elimination
- Elimination of the need for supplementary carbon sources for denitrification
- Elimination of Intermediate decanters used in the nitrification/denitrification stages

The oxidation ditch type aerobic digester (reactor) is designed to reach a total and complete mixture with no un-mixed areas.

Secondary Clarifier
Treated effluent is transported from the aerobic digester to the secondary clarifier to separate generated solids (not dissolved BOD_5) by gravity precipitation. Clarified water would flow through stainless steel V-shape drains located around the clarifier to a re-collection canal. The clarifier consists of a concrete circular tank with central wastewater feeding, including an arrangement of concentric scrappers, a mechanical system for solids floating removal (Skimmer), and a sludge pump system. Part of the sediment sludge would be re-circulated through the aerobic digester to maintain an ideal sludge concentration in the biologic reactor. The sludge that was not re-circulated would be transferred to a surge tank and pumped to an aerobic tank to increase density.

Disinfection
This is the final stage, prior to the treated effluent discharge to the Arroyo Huahuatay. The effluent would go through a disinfection process using UV light as the disinfectant agent. The wastewater coming from the secondary clarifier would advance to the "disinfection chamber" to expose pathogen microorganisms to the UV emissions, constantly maintaining the flow and exposure time parameters.

Advantages and Benefits of using Ultraviolet Light

- Toxic chemical products are not required
- No risk of an overdose
- Friendly environment, no byproducts
- Low energy consumption
- Small depreciation
- Low investment and operating cost
- Pathogen inactivation in just fractions of a second
- No damage to hydraulic infrastructure
- Simple application
- Flexibility to adapt to variable water effluent conditions
- Anticipated significant future growth of the application of this technology

Sludge Aerobic (Thickener)
The sludge generated during the EA/AS process is more stable than the sludge coming from conventional treatment plants; therefore, an aerobic tank thickener would complete this sludge stabilization.

The function of this stage is to kill the pathogen microorganisms by injecting oxygen into the tank. This oxygen encourages the larger microorganisms to use their own protoplasm as their primary source of food, and smaller microorganisms as their secondary source.

The sludge digester consists of a metal tank with an epoxy or fiberglass interior coating. The digester will allow the settling of the received effluent and will supply enough oxygen for sludge stabilization.

Partial Sludge Dehydration
Sludge dehydration will follow after it has achieved stabilization. This occurs by adding synthetic polymer for solids flocculation. Sludge will be pumped to a centrifugal unit for dewatering and will reach between 20 to 25% of water content. The stabilized and dehydrated solids will be disposed of in the official site assigned by the CESPT and authorized by the Dirección General de Ecología (State Department of Environment).

3.0 ENVIRONMENTAL SETTING AND ENVIRONMENTAL CONSEQUENCES

The potential environmental impacts on the Coastal areas in San Diego County in southern California, and Playas de Rosarito, Baja California, Mexico, near the proposed project are addressed in this section (See Figure 1 - 3 – Area of Concern).

3.1 LAND USE

3.1.1 Environmental Setting

The environmental setting in the vicinity of the border in the U.S. is characterized by a combination of industrial, agriculture, rural and open space land uses. Important features of this area include the Pacific Ocean; the Tijuana River National Estuarine Research Reserve and Imperial Beach Naval Air Station in the City of Imperial Beach; the Tijuana River Valley; and the communities of San Ysidro and other border areas within the City of San Diego. San Ysidro is the main urban border community in the U.S. within the study area. Across the border in Mexico lie highly urbanized portions of the city of Tijuana and Playas de Rosarito that extend fully to the international border.

Topographic features include the relatively flat alluvial plain of the Tijuana River with tributary canyons and hillsides extending up into Mexico. The Tijuana River and the Pacific Ocean are the most notable hydrologic features of the area. Biological resources range from the diverse flora and fauna of the Tijuana River estuary to scrub habitats adjacent to the estuary. Climate and meteorological influences include the cool semiarid steppe climate of the area with warm dry summers, mild winters, and ocean breezes. The air quality is generally characterized as being fair to good, although the San Diego Air Basin (SDAB) is in nonattainment with federal standards for ozone (SDAPCD, 2005)

The Tijuana Estuary is the end-point of the 1,739 square-mile Tijuana River Watershed. Nearly three-fourths of the watershed lies in Mexico, encompassing 2,500 acres; the Tijuana Estuary has been designated as a wetland of international importance.[6]

Rosarito is bordered by Tijuana to the north and east, Ensenada to the south, and the Pacific Ocean to the west; the municipal territory consists of an area of 198.19 square-miles (513.32 km^2). Playas de Rosarito is shaped by 5 miles of sandy beaches, including some plateaus and staggered hills.

3.1.2 Environmental Consequences for Land Use

3.1.2.1 No Action Alternative – 1

If the proposed projects were not implemented, land characteristics under the No Action Alternative would not substantially change. There would be no significant direct, indirect, or cumulative impacts on land use by the No Action Alternative.

[6] Tijuana Estuary http://trnerr.org

3.1.2.2 Action Alternatives – 2, 3, and 4

The project is located 13 miles (21 km) south of the U.S./Mexico Border; therefore, the proposed alternatives would not directly, indirectly, or in the long term affect land use in the United States.

Implementation of the Action Alternatives regarding the WWTP expansion would not be expected to promote any significant conversion or alteration of land in Playas de Rosarito.

The main purpose of the proposed improvements is to increase the water treatment effluent at the Rosarito I WWTP from 60 lbs to 120 lps. The project will be implemented in already disturbed areas of the Playas de Rosarito municipality; thus, there would not be direct or indirect impact to the land use in the area of concern. Additional sludge generated will continue to be disposed of at an existing sludge disposal facility 19 km south of the border and land use would therefore not change at this location either.

3.2 AIR QUALITY

3.2.1 Environmental Setting

The area of influence for this project would, in general, include the SDAB, although only those areas directly adjacent to the international border would be subject to potential localized air quality impacts such as those related to dust or odors arising from the construction and operation of wastewater infrastructure in Mexico.

Climate

The climate in San Diego County is influenced by the Pacific Ocean and its high-pressure systems, which result in dry, warm summers and mild, occasionally wet winters. The normal wind pattern throughout the County is predominantly westerly to northwesterly (i.e., blows predominantly towards the east and southeast) (City of San Diego Metropolitan Wastewater Department (MWWD), 1996). This pattern is occasionally disrupted by the Santa Ana wind conditions, during which offshore winds blow pollutants out to the ocean, resulting in clear days. If the Santa Ana conditions are combined with a low pressure system in Baja California, a pollutant laden air mass is drawn southward from Los Angeles and Orange Counties to produce some of the highest levels of air pollution found in the SDAB.
During the winter, afternoon temperatures vary from 60 ºF to 80 ºF, summer temperatures range from 80ºF to 100ºF. The average annual precipitation in the area is 9.5 inches, falling predominantly from November through April (CH2M HILL, 1998).

Mild humid Mediterranean weather predominates in Playas de Rosarito, with rains in winter, mainly in January and February. The annual precipitation shows an average of 10.74 inches (273 mm). The annual average temperature is 62.6^{o}F (17^{o}C). Regularly, winds come from the northwest and southwest with a mean speed of 6.2 miles/hr (10 km/hr)[7].

Air Quality

An area is designated “in attainment” when it is in compliance with the National and/or California Ambient Air Quality Standards. These standards are set by the federal EPA or the California Air Resources Board (ARB) for the maximum level of a given air pollutant which can exist outdoors without detrimental effects on human health or public welfare.

[7] Enciclopedia de los Municipios de Mexico (Mexican Municipalities Encyclopedia) http://www.e-local.gob.mx/wb2/ELOCAL/ELOC

Both the United States Government and the State of California have enacted legislation designed to improve air quality. The 1970 Federal Clean Air Act covers the entire country. This law (and its amendments in 1977 and 1990) allows individual states to have stronger standards, but states cannot have weaker standards than those set for the entire country. California adopted its own stricter standards in its Clean Air Act in 1988.Table 3-1 shows San Diego County's federal and state designations for each of the criteria pollutants:

Table 3-1 San Diego County's designations for criteria pollutants

Criteria Pollutant	Federal Designation	State Designation
Ozone (one hour)	Attainment*	Nonattainment
Ozone (eight hour)	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Attainment
PM 10	Unclassifiable**	Nonattainment
PM 2.5	Attainment	Nonattainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility	(no federal standard)	Unclassified

* The federal 1-hour standard of 12 pphm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.
** At time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

Source: Air Quality in San Diego County, 2007 Annual Report

Ambient air quality monitoring data on the criteria pollutants in the San Diego Air Basin area are available from a monitoring network operated by the San Diego Air Pollution Control District (APCD). The District conducts its air sampling at 10 monitoring stations in the western region.[8]

In Tijuana and Playas de Rosarito, as in other communities, air quality problems are due to the volume of suspended particles (PM_{10}) emissions resulting from the traveling of automotive vehicles on the soil surface, as well as from wind currents that frequently blow in this area.

[8] County of San Diego, Air Pollution Control District http://www.sdapcd.org/air/air_quality.html

Table 3-2 Summary of Air Quality Data of the San Diego Air Basin

Pollutant		Number of Days Over Standard				
		2003	2004	2005	2006	2007
Ozone (1-hr)	Federal	1	1	0	0	1
	State	23	12	16	23	18
Ozone (8-hr)	Federal	6	8	5	14	7
	State	n/a*	n/a*	n/a*	68	43
Carbon Monoxide (1-hr)	State and Federal	0	0	0	0	0
Carbon Monoxide (8-hr)	State and Federal	1	0	0	0	0
Sulfur Dioxide	State and Federal	0	0	0	0	0
Nitrogen Dioxide	State and Federal	0	0	0	0	0
Lead		**	**	**	**	**
Particulate Matter		**Particulate Matter Exeedences (yes/no)**				
		2003	2004	2005	2006	2007
Particulates (PM10)	Federal Annual Arithmetic Average (μ/m3)	yes	yes	yes	yes	no
	Federal 24-Hour	no	no	yes	no	no
	State Annual Arithmetic Average (μ/m3)	yes	yes	yes	yes	yes
	State 24-Hour	yes	yes	yes	yes	yes
Particulates (PM2.5)	Federal Annual Arithmetic Average	yes	no	yes	no	no
	Federal 24-Hour	yes***	yes	yes	yes	yes
	State Annual Arithmetic Average (μ/m3)	yes	yes	yes	yes	yes

* State 8-Hour Standard adopted in 2006
** Data not available
*** High levels due to wildfires in 2003

Source: County of San Diego, Air Pollution Control District

Another significant problem is the large amount of pollution produced by mobile sources (cars, trucks, buses) that travel through the city, especially during peak traffic hours, and the constant, year-round vehicle border crossing. The problem is compounded by the large number and poor condition of the vehicles traveling through the city.

Particles of less than 10 micrometers have an indirect effect on the respiratory system, because they absorb microbiological agents (virus, bacteria, pollen, etc.) on their surface and transport them to the lung. There are numerous other area emissions sources that may potentially occur in the area of concern including residential fuel combustion, waste disposal (refuse burning), fires (wild fires, prescribed burning, structural fires), agricultural production, wire reclamation, manure burning, and manufacturing industries.

3.2.2 Environmental Consequences for Air Quality

3.2.2.1 No Action Alternative – 1

The No Action Alternative would not directly, indirectly, or cumulatively impact climate and/or air quality in the United States and Mexico. There would be no effect on air resources related to emissions, dust, and particulates produced by construction-related activities.

Unpleasant odors may be produced in the Playas de Rosarito communities if untreated water is directly released to water bodies or open canals. Additionally, health hazards risk would increase for nearby residents, as is discussed further in this section. These odors would not reach the US because of the distance of proposed projects to the US-Mexico border.

3.2.2.2 Action Alternatives – 2, 3, and 4

Site preparation and construction activities would result in the emission of sulfur oxides, nitrogen oxides, hydrocarbons, carbon monoxide, and particulate matter from equipment exhaust, and particulate matter from fugitive dust. These emissions would be generated from earthwork activities (i.e. grading, trenching/excavation, filling, etc.) and from major hauling operations, if necessary, to remove excavated material or to bring in supplies. Of particular potential concern would be nitrogen oxide emission, which are a precursor to ozone and are associated with diesel engine exhaust.

Construction of the proposed action alternatives may contribute to temporary fugitive dust emissions associated with disturbing dry soils during excavation. During construction, emissions would be produced on-site by earthmoving equipment and by vehicular traffic traveling throughout the construction site. The fugitive dust emissions could potentially impact ambient PM10 concentrations and visibility in the immediate vicinity of excavations. Construction of these alternatives has the potential for temporary adverse impacts to air quality in the proposed project area in Playas de Rosarito. However, significant air quality degradation in US is unlikely since the proposed action would take place approximately 13miles (21 km) south of the U.S./Mexico border, and noise, dust, and exhaust emissions would not be perceived in the U.S.

The quantity of these emissions would also vary depending upon the types and level of activities occurring and the weather conditions. These impacts would be minor and would be limited to the construction period. Standard dust suppression techniques such as watering of active construction areas, aggregate piles, and cleared areas would substantially minimize these potential air quality impacts.

3.3 WATER RESOURCES

3.3.1 Environmental Setting

Surface waters

For many years, untreated wastewater originating in Tijuana, Mexico contaminated beaches in the United States on a continuous basis. Much of the city's wastewater drained, untreated, into the Tijuana River, where it flowed across the border, into the Tijuana Estuary, and onto the beach just south of Imperial Beach, CA. Currently, as a result of wastewater treatment facilities including the International Treatment Plant in San Ysidro, CA, and San Antonio de Los Buenos in Tijuana, nearly all dry-weather flows in the Tijuana River are captured, thereby avoiding the daily contamination of California beaches. However, during large storms, flows in the river exceed the treatment plants' capacities and contamination of California beaches occur.

The project covered by this EA, however, falls outside of the Tijuana River drainage basin, so this project will have no effect on flows in the Tijuana River.

The drainage basin covered by this project does not cross into the U.S. The 48.2 km^2 watershed that covers this area drains into the Pacific Ocean through any of the intermittent rivers and canyons exiting in the area such as the Huahuatay, Reforma and Rosarito whose flows are intermittent and occur during rainy season. (See Figure 1 - 4 –water bodies in the area of concern in Playas de Rosarito).

The Huahuatay creek, located at Latitude 32° 21' North and Longitude 117° 00' west, runs east to west for 13 miles. Flows consist of agricultural drainage, stormwater, sewage from houses not connected to the sewer system, and treated effluent from the Rosarito I wastewater treatment plant. The stream empties into the Pacific Ocean 13.5 miles south of the international border. The Rosarito I WWTP discharges its effluents approximate 1.5 miles away from the coast. Stormwater runoff and untreated discharges from the east part of the city flows to this creek. The entire creek discharges out the ocean outfall.

The Rosarito creek, located at latitude 32° 19' N 117° 00' W, runs east to west for 15 miles and empties into the Pacific Ocean. Flows consist primarily of stormwater and agricultural drainage, since there are not many urban areas nearby. The river is located outside of the city limits however some housing area can be observed next to the river as it approximates to the coast shoreline.

The Reforma or "Arroyo Seco" creek, located at a 32° 22' N 117° 4' W, runs east to west for 8 miles and empties into the Pacific Ocean. Flows consist of stormwater and sewage from houses not connected to the sewer system; it also receives treated effluent from the Rosarito Norte WWTP. The plant discharges practically at the coast shoreline (200 meters away). Stormwater runoff and untreated discharges from the north part of the city flows to this creek.

Ocean water quality in the vicinity of the international border may be affected by surface runoff and by discharges from wastewater plants, and untreated wastewater released to local water bodies (Camp Dresser and McKee, 2006). The fate of point sources wastewater discharged into offshore waters is determined by oceanographic conditions and other events that impact horizontal and vertical mixing. Changes in current patterns, water temperatures, salinity, and density can affect the fate of the wastewater plume. These types of changes can also affect the distribution of turbidity (or contaminant) plumes that originate from various non-point sources.[9]

Southern California weather can generally be classified into wet (winter) and dry (spring-fall) seasons (NOAA/NWS 2008a), and differences between these seasons affect certain oceanographic conditions (e.g., water column stratification, current patterns and direction). Understanding patterns of change in such conditions is important in that they can affect the transport of distribution of wastewater, storm water, or other types of turbidity plumes that may arise from various point and non-point sources (e.g. ocean outfalls, storm drains, outflows from rivers and bays, surface runoff from coastal watersheds). Winter conditions typically prevail in southern California from December through February during which time higher wind, rain and wave activity often contribute to the formation of a well-mixed or relatively homogeneous (non-stratified) water column. The chance that the wastewater from any given ocean outfall may surface is highest during such times when there is little, if any, stratification of the water column. These conditions often extended into March as the frequency of winter storm decreases and the seasons begin to transition from wet to dry. In late March or April the increasing elevation of the sun and lengthening of days begin to warm surface waters, mixing conditions diminish with decreasing storm activity, and seasonal thermoclines and pycnoclines become re-established. Once the water column becomes stratified again by late spring, minimal mixing conditions typically remain throughout the

[9] City of San Diego Ocean Monitoring Program

summer and early fall months. In October or November, cooler temperatures associated with seasonal changes in isotherms, reduced solar input, along with increases in stormy weather, begin to cause the return of well-mixed or non-stratified water column conditions.[10]

The currents along the California coast are dominated by the offshore, southward-flowing California current. The California current system consists of (1) a broad southerly flowing surface and near surface current that flows at the edge of and beyond the continental shelf, (2) a northerly flowing undercurrent that flows under the southerly current, and (3) northerly countercurrents at the surface and near-surface which flow near the coast (Recon 1994, U.S. Army Corps of Engineers, 1998, CDM 2008). The California current varies in position and intensity based on the season, shifting onshore during the spring and summer. The northward flowing countercurrent is found at a depth of 90 feet and flows from Baja California to northern California, bringing warm, high salinity Equatorial Pacific water. There is an equatorial coastal flow that occurs with the northerly undercurrent from early spring to fall caused by wind stresses. Once the wind stresses subside (September) a broad northward surface current called the Davidson current begins to develop approximately 62 miles offshore. The dynamics of the flows are influenced by the interactions of coastal currents within the California system and the seasonal upwelling events that bring cool, dense water to the surface (CDM 2003).

Modeling of the flow patterns found the principal pattern to be a relatively uniform long shore flow north and south along the coastline, and a recurring eddy with counterclockwise circulation south of Point Loma of varying intensity found anywhere from 6.2 to 9.3 miles (9.92 to 14.88 km) offshore and roughly 10.6 miles (16.96 km) alongshore (CH2M HILL, 1998).

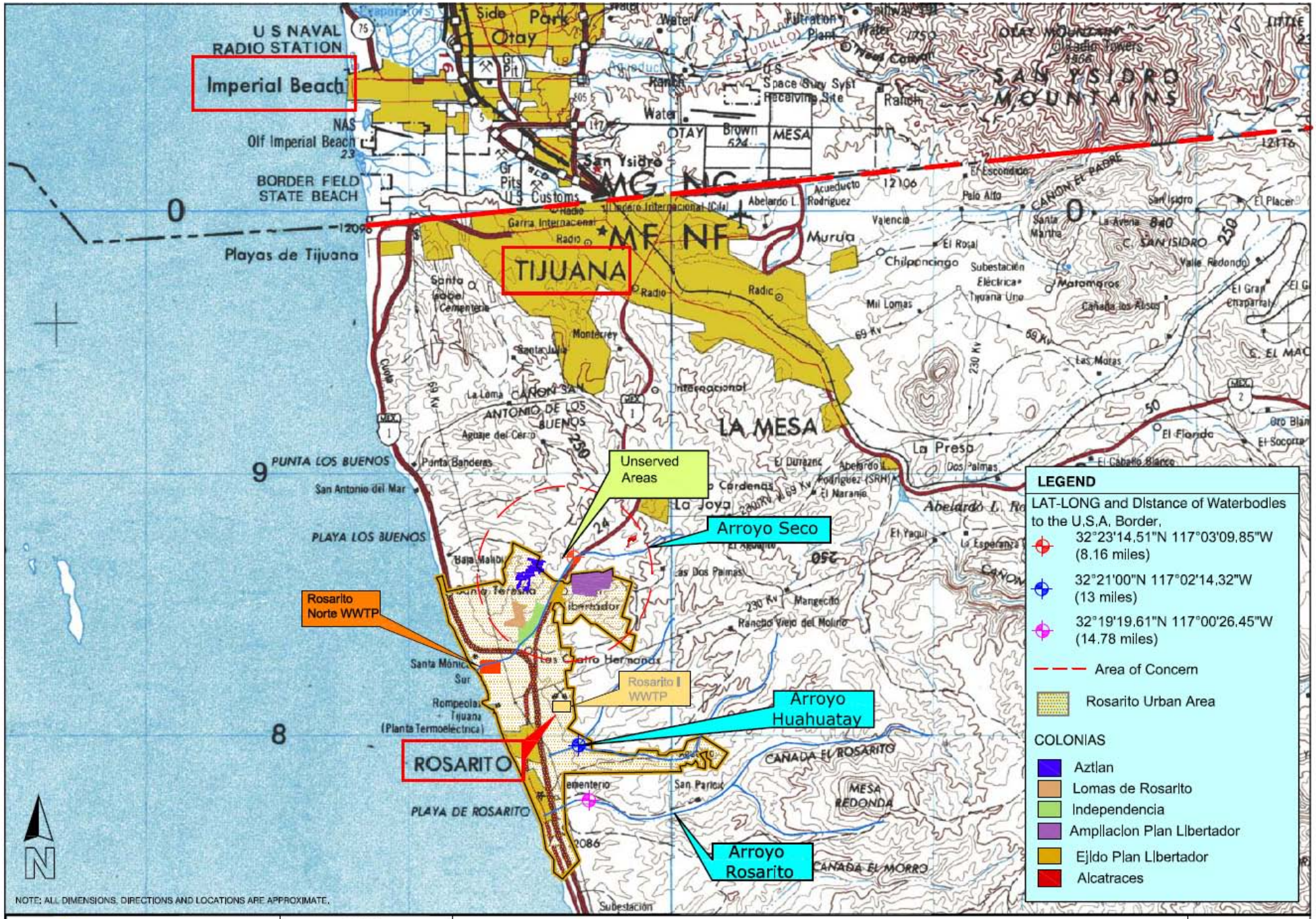
Ocean water quality in the vicinity of the international border may be affected by surface runoff and by discharges from wastewater plants. A brief description of these treatment plants is provided below.

Groundwater

The Rosarito River valley groundwater basin is recharged by the Rosarito River, Las Palmas River and Descanso River particularly in areas outside of the city of Rosarito. This groundwater is entirely located within Mexico.

The transboundary Tijuana Groundwater Basin underlies the portion of the Tijuana River Valley. The eastern and northern boundaries are the contacts with semi-permeable Pleistocene and Pliocene marine deposits. The western boundary is the Pacific Ocean. In the U.S., the intermittent Tijuana River and several ponds are hydrologic surface features in the basin. The primary source of aquifer recharge appears to be the Alamar River, which originates in the coastal San Ysidro Mountains and confluences with the Tijuana River. Other likely sources of recharge are winter rainfall (particularly on undeveloped land north of the border and in Alamar Valley), 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 US than Mexico, since the Tijuana River is a concrete lined channel from the international border to Rodriguez reservoir.

[10] City of San Diego Ocean Monitoring Program



Ninyo & Moore	DATE 02/20/09	HYDROGRAPHY OF THE AREA OF CONCERN IN PLAYAS DE ROSARITO
BECC COCEF	PROJECT NO. 302 715 001	Proposed Expansion of the Wastewater Collection System to Unserved Areas in the Cities of Tijuana and Playas de Rosarito, Baja California

Several factors, including imported irrigation water, reduced pumping due to degraded groundwater quality, and the abandonment of farming activities have contributed to the decline in groundwater usage since 1952 in the U.S. (MWWD, 1996). This has allowed groundwater levels to recover to within 0 to 15 feet (0 to 4.5 meters) of the ground surface (CH2M HILL, 1998). There is currently no known extraction of groundwater from the Tijuana River basin in the U.S. for any purpose except limited agricultural use (MWWD, 1996). Groundwater extraction in the Tijuana River valley north of the international border was 1,500 acre-feet per year (DWR, 2006).

Due to the location of this project, the Tijuana River Groundwater Basin will not be impacted.

3.3.2 Environmental Consequences for Water Resources

3.3.2.1 No Action Alternative – 1

The No Action Alternative would result in the continued disposal of untreated wastewater to the environment, particularly to surface water courses near the unserved areas such as the Arroyo Huahuatay. As previously indicated, it is estimated that the communities that are being connected to the wastewater collection system will generate about 1 mgd (44 lps) of raw wastewater by 2015. A portion of this wastewater will reach the environment in coastal areas of Playas de Rosarito and the Pacific Ocean approximately 13.5 miles (22 km) south of the U.S./Mexico border with the potential to impact groundwater formations and the Pacific Ocean.

Raw wastewater discharges to the ocean would increase concentrations of bacteria, biochemical oxygen demand (BOD), nutrients, toxic constituents, and metals in the areas of discharge. Combined with stormwater runoff, the raw wastewater could contribute to degradation of coastal water quality.

Indirect impacts to U.S. coastal waters could occur if ocean currents carry contaminants north past the international border. Ocean currents in this region typically experience a southward flow regime, although there are some exceptions in which the ocean currents flow northward or overall weak current conditions cause a plume to spread in both directions (Ocean Imaging, 2002). During these times, discharges from Playas de Rosarito may reach US waters; however, considering the distance to the border, natural attenuation and dilution, the potential incremental impact of the No Action Alternative on water resources and water quality in the US would not be significant.

Untreated wastewater discharges to the ocean would increase bacteria concentrations in the areas of discharge. As mentioned before, combined with stormwater runoff, the raw wastewater would cause degradation of coastal water quality near Playas de Rosarito. This would have a direct adverse impact to water quality in inland streams and coastal waters of Rosarito. It would have no impact on the water quality of the Tijuana River.

Untreated wastewater could negatively impact groundwater resources in the area.

3.3.2.2 Action Alternatives – 2, 3, & 4

The implementation of the proposed actions would allow for a greater treatment capacity of wastewater (60 lps to 120 lps) that is currently collected but that lacks access to treatment. Capacity would be available for wastewater treatment for the short- and mid-term. The wastewater would be treated by the proposed methods instead of being directly disposed into the streets and water bodies that could eventually reach the Pacific Ocean. This would eliminate potential surface water and groundwater

contamination by fecal coliform bacteria and other parasites commonly associated with the continued and increased use of open ditches and failing septic tanks for wastewater disposal and from infiltration.

It is estimated that 1 mgd (44 L/s) of raw sewage would be collected and treated at the new module of the Rosarito I WWTP, thus improving water quality in surface water streams and the ocean in the coastal areas of Playas de Rosarito. The WWTPs would discharge treated effluent in the ocean, in compliance with Mexican norms. The high quality of the treated effluent, combined with natural dilution of the effluent in the ocean water, would prevent any harm to U.S. coastal resources.

This alternative could indirectly benefit coastal waters of the US by reducing the amount of untreated wastewater that enters the Pacific Ocean. However, this potential beneficial impact would not be significant given typical current patterns in the region, the distance of the effluent discharge point relative to the U.S, and the natural dilution of effluent that would occur before any untreated wastewater reaches the U.S.

This alternative could also improve groundwater resources in Mexico by reducing the infiltration of raw wastewater into the groundwater basin. However, these beneficial effects to groundwater would not be realized in the U.S.

3.4 BIOLOGICAL RESOURCES

3.4.1 Environmental Setting

The U.S./Mexico border region supports a particularly high biodiversity of flora and fauna, including many endemic species that have evolved within the diverse physical and climatic conditions of the region (Stebbins and Major 1965; Raven 1988; Mittermeier, et al. 1999). Biological resources are organized into biological communities characterized of specific biophysical and climatic conditions. For example, lower elevations within the border region support coastal scrub and grassland communities whereas higher elevation areas support chaparral; conifer, oak, and cypress forests; and woodlands.
Willows and cottonwoods dominate coastal-draining stream systems where water is abundant, and sycamores and oaks populate dryer areas. Eastern draining streams and oases often support native palms. Community diversity in the border region is similarly high. For example, nearly a dozen different chaparral communities are distributed along different elevation and climate gradients and among different soil types. Many communities, such as vernal pools, are highly restricted in distribution and their species compositions are unique to the border region.[11]

The South Coast Eco-region, which encompasses part of the border region, is one of the most species-rich regions of the California Floristic Province (Stebbins and Major 1965; Raven 1995). This statistic is particularly notable because the California Floristic Province is recognized as one of the world's richest floristic regions (Mittermeier, et al. 1999). Within the California/Baja California border region, endemic plant species live in isolated habitats, such as vernal pools (e.g., Otay Mesa mint), peaks of metavolcanic and gabbro rock (e.g. Tecate cypress), and high elevation "islands" (e.g. Cuyamaca cypress). Many plant species are listed as threatened or endangered or are otherwise considered sensitive, primarily due to habitat loss and fragmentation from development (Flores Villela and Gerez 1994; Minnich and Franco Vizcaino 1998; Stephenson and Calcarone 1999).

Although levels of animal endemism are not as high as the levels of plant endemism, many resident and migratory wildlife species in the border region are listed as threatened or endangered or are otherwise considered sensitive. These species include invertebrates (e.g. Thornes's hairstreak, Quino checkerspot

[11]Designing And Establishing Conservation Areas In The Baja California-Southern California www.scerp.org/pubs/mono15.htm

butterfly, and San Diego fairy shrimp), herpetofauna (e.g. arroyo southwestern toad, San Diego horned lizard, and San Diego pond turtle), birds (e.g. California gnatcatcher, coastal cactus wren, and least Bell's vireo), and mammals (e.g. bighorn sheep, mountain lion, and American badger). It is particularly difficult to sustain viable populations of mammalian species because they require large areas of unfragmented habitat.

In summary, the border region's high topographic, geologic, and climatic variations produce conditions that support the region's diverse unique flora and fauna. Many of these species are found nowhere else in the world and are threatened with extinction. The ecosystems that support these species were historically continuous across landscape. Today, however, the U.S. - Mexican border bisects these ecosystems. Without proactive efforts to develop a binational conservation network, they may be irretrievably isolated from each other.[12]

Natural habitats enclosed in the area of concern might be affected by construction activities; however, much of the local biological resources, especially on the south side of the border have been already disturbed, except for the Tijuana Estuary in southern California, where the Tijuana River meets the Pacific Ocean.

The tidal flushing of the Tijuana Estuary maintains a variety of habitats, which in turn support a broad range of organisms. A listing of plant and animal species with state or federal listing as threatened or endangered is provided in Appendix A. The following provides an overview of habitats and describes the status of regionally significant resources:[13] [14]

3.4.2 Environmental Consequences for Biological Resources

3.4.2.1 No Action Alternative - 1

The implementation of the No Action Alternative will not directly, indirectly, or cumulatively impact the transboundary flora, fauna and threatened and endangered species in the United States.

Untreated wastewater discharges to streams and the Pacific Ocean have the potential to adversely affect aquatic life in Mexico. Discharges from Rosarito would not usually reach coastal waters of the US because of the 22 km (13.5 miles) distance and the natural southward flow of currents in the Pacific Ocean. During times of northward current flow, discharges from Playas de Rosarito may reach US waters but would experience natural attenuation and dilution given the considerable distance to the border. Therefore, raw wastewater from Rosarito would not indirectly or directly affect coastal vegetation, wildlife, and fish.

Under the No Action Alternative, raw wastewater would continue to affect streams and coastal areas in Mexico. Effects on migratory bird habitat in Playas de Rosarito would likely be minor as the project area is highly developed and offers little bird habitat.

[12] Designing And Establishing Conservation Areas In The Baja California-Southern California www.scerp.org/pubs/mono15.htm

[13] Tijuana Esturary http://trnerr.org/

[14] Tijuana River National Estuary Reaearch Reserve TRNERR Comprehensive Management Plan, 2007-2012 //trnerr.org/l

3.4.2.2 Action Alternatives - 2, 3, and 4

The proposed Action Alternatives will not directly, indirectly or cumulatively impact flora, fauna and threatened and endangered species in the United States, because the proposed construction activities will be located approximately 13 miles (21 km) south of the U.S./Mexico border in already disturbed areas within the municipality of Playas de Rosarito.

The primary effect of this action alternative would be the potential loss of any existing vegetation and wildlife habitat during construction an operation activities. Vegetation and wildlife communities in the project area would not be significantly affected by habitat loss because the expansion construction, conveyance and treatment systems would occur in areas that are previously disturbed.

Construction and operation of the Rosarito I WWTP would occur at sites and properties that are currently in use, therefore, long-term and short-term direct/indirect impacts to wildlife communities with the implementation of the action alternatives would not be significant.

Cumulatively, if a higher quantity of treated water is released to local streams and/or the ocean, (instead of raw wastewater); therefore, it is anticipated that positive effects would be observed in areas near the discharging points, contributing with the conservation of local vegetation, aquatic species, and migratory birds.

This could result in indirect benefits to biological resources in the coastal waters of the US. However, the proposed action would be 13 miles south from the US-Mexico border; therefore, potential indirect beneficial impacts that may be observed in the aquatic biological resources in the US would be marginal.

3.5 CULTURAL RESOURCES

3.5.1 Environmental Setting

Four tribal groups make up the indigenous Indians of San Diego County. The Kumeyaay/Diegueño, the Luiseño, the Cupeño, and the Cahuilla. The Diegueño, which is the largest group, once encompassed the lands from northern San Diego to the dunes of the Imperial valley and south beyond Ensenada, Mexico.[15] In the U.S., close Kumeyaay reservations to the construction affected zone include Jamul, Sycuan, Campo, La Posta, Manzanita and Cuyapaipe. The Kumeyaay in Baja California, Mexico, are called Kumiai. Several Kumiai villages or communities exist, including San Jose de la Zorra, San Antonio Necua, La Huerta, and Juntas de Neji.[16] None of these reservations will be affected by any of the proposed alternatives.

3.5.2 Environmental Consequences for Cultural Resources

3.5.2.1 No Action Alternative - 1

Implementation of the No Action Alternative will not directly nor indirectly affect transboundary historic and cultural resources in the United States or Mexico since construction alternatives related to the proposed action would not occur in this country.

[15] Campo Kumeyaay Nation http://www.campo-nsn.gov/index.html
[16] SDSU Library http://infodome.sdsu.edu/research/guides/calindians/insdcnty.shtml

3.5.2.2 Action Alternative - 2, 3, and 4

The proposed project will be constructed and operated in Mexico and will not directly nor indirectly impact transboundary historic and cultural resources of the United States. The proposed projects are located 13 miles (21 km) from the U.S. border. Construction and its associated activities, if the proposed action is implemented, will be executed in Playas de Rosarito, Baja California, Mexico.

Under the action alternatives for the WWTP expansion, construction will occur on already disturbed areas located within the Playas de Rosarito Municipality. In accordance with best management practices on behalf of the Instituto Nacional de Antropologia e Historia (INAH), if previously unidentified cultural resources are discovered during the project activities, the contractor will stop work immediately at that location. The contractor will take all responsible steps to secure the preservation of those features, and notify the State of Baja California-INAH. If deemed necessary, INAH officials in Mexico City would evaluate the significance of the resources before any further construction activities.

3.6 NOISE

3.6.1 Environmental Setting

The area of influence with respect to noise is limited to those areas in the US that are immediately adjacent to the international boundary. Due to the highly urbanized nature of Tijuana near the international border and the existing noise environment throughout much of the urbanized area immediately adjacent to the border within the US, the study area is characterized primarily by vehicular noise from car and truck travel, commercial aircraft noise from operations at the Tijuana Airport, and general urban activities. Local noise sources from within the area of influence include vehicular noise on Interstate 5 and local roads, aircraft operations associated with Brown Field and the Imperial Beach Naval Auxiliary Landing Field, and general urban activities within the more developed pockets along the border such as around the border crossing stations. Ambient noise levels are estimated to range from approximately 45 decibels A-weighted (dBA) in remote undeveloped areas to over 70 dB near freeways and highly urbanized areas.

Noise Standards

The City of San Diego established noise ordinances that regulate construction and operation noise levels on specific types of land uses. Although these noise ordinances do not apply to activities occurring outside of the US, they provide a reasonable basis for evaluating the significance of potential noise impacts associated with the proposed action. Ordinance 59.5.0404 states that construction noises may not exceed 75 decibels equivalent sound level (dB Leq) between 7:00 A.M. and 7:00 P.M. in residential areas. Operational noise levels (established in Ordinance 59.5.0401) vary by land use type, and are lower during the nighttime. Residential uses range from 45 dB Leq to 60 db Leq, commercial ranges from 60 dB Leq to 65 dB Leq, and industrial uses have a limit of 75 dB Leq (Recon, 1994).

Sensitive Noise Receptors

Sensitive noise receptors typically include residential development, schools, and hospitals. Under certain conditions, habitat areas can also be considered to be sensitive receptors, such as when noise levels exceed 60 dBA in nesting areas for least Bell's vireo (*Vireo bellii*) and California gnatcatcher(*Polioptila californa*) during the respective breeding seasons. Federal regulatory guidelines establish the following breeding seasons for these two species: February 15 through August 30 for the least Bell's vireo, and April 10 through July 31 for the California gnatcatcher. In general, the presence of such receptors is limited to the western portion of the area of influence. Rural residential development occurs in and near the Tijuana River estuary.

Residential subdivisions occur to the north of the Tijuana River between Dairy Mart Road and Interstate 5, as does a public school located southwest of the Interstate 5/Via de San Ysidro interchange. With the exception of areas immediately adjacent to Interstate 5, the area of influence east of Interstate 5 is generally undeveloped or is occupied by non-sensitive uses such as agricultural or industrial/business park development. Existing background noise levels within the area of concern in US are unlikely to be affected by the implementation of the proposed action. However, Playas de Rosarito, Baja California is more likely to be affected by the following sources: wind, traffic, occasional construction activities, and other common city noises.

3.6.2 Environmental Consequences for Noise

3.6.2.1 No Action Alternative - 1

There would be no noise generation impacts because construction activities of the proposed action would not take place.

3.6.2.2 Action Alternatives - 2, 3, and 4

The City of San Diego prohibits excessive and annoying noise levels within the city limits to prevent harm to the health and welfare of citizens. The City's Noise Ordinance (San Diego Municipal Code, Section 56.5.01) defines noise and regulates it by type, land-use zone, and time of day. Events or actions may be prohibited if they cause a noise disturbance. Loud construction noise is permitted from 7 a.m. to 7 p.m., Monday through Saturday, but not on Sundays or legal holidays.[17]

Noise levels at the proposed construction sites will be within regulated levels. Due to attenuation and the location of the project in Mexico over 13 miles away from the border, there will be no negative impacts on ambient noise levels in the United States. Therefore, none of the Action Alternatives are expected to generate transboundary noise impacts in the United States.

The Action Alternatives are not expected to impose significant long-term noise impacts on the proposed project area. Background noise levels may be elevated during construction activities associated with the proposed action. Construction noises tend to be short in duration and concentrated around the immediate work area. Construction-related noise would be mitigated using standard procedures such as specific weekday hours of operation and the use of mufflers on construction equipment.

3.7 SOCIOECONOMICS

3.7.1 Demographics

According to the "Economic Impacts of Wait Times at the San Diego – Baja California Border"(SANDAG, 2006) over 60 million people cross the San Diego County – Baja California border annually. Approximately half of these trips are for shopping and recreation, while approximately 10 million trips per year are made to and from work. In addition, 730,000 trucks cross this border annually from Mexico.

Given the high interrelationship between people in Tijuana and San Diego, public health issues on one side of the border may impact residents on the other side. Improving sanitary and environmental conditions and public health conditions in Tijuana would be beneficial to San Diego County.

[17] The City of San Diego, Noise Abatement http://www.sandiego.gov/nccd/noise/

Playas de Rosarito municipality consists of a territorial extension of 513.32 km2 (198.19 square miles) with 83,433 (CONEPO, 2008) inhabitants. There are 116 subdivisions in the Playas de Rosarito municipality, 113 of them rural communities with 8,560 inhabitants, the other three are urban cities with more than 2,500 people each, totaling 74,873 metropolitan residents.

In recent years, Playas de Rosarito has experienced the greatest growth percentage of all Baja California municipalities, with 4.91 percent growth in 2008.
The service industry represents the main economic activity for this region, having a great variety of tourism attraction for national and international visitors. Commerce is other important activity for Playas de Rosarito, generating a great number of employments and capturing a significant amount of foreign currency (U.S. dollars).

3.7.2 Environmental Consequences for Socioeconomics

3.7.2.1 No Action Alternative – 1

With the implementation of the No Action Alternative, the number of jobs and the total workforce in the area of concern would remain the same. The daily border crossing for tourism and commercial purposes would continue as usual. Therefore, no direct, indirect, or cumulative impact on the local economy in the study area would occur with the implementation of the No Action Alternative.

The No Action Alternative would not have any indirect impacts to recreation and tourism at US beaches because ocean currents tend to experience a southward flow regime and contaminants from Rosarito's raw sewage discharges would not reach US beaches. Therefore, visitation to beaches would not decline as a result of raw sewage discharges from the unserved areas.

With the No Action Alternative, the total workforce and living conditions of the local residents in Playas de Rosarito would remain about the same. Therefore, no direct, indirect or cumulative impact on the local employment or the economy would occur with this selection. Demand for housing and vacancy rates would not be expected to change with the implementation of the No Action Alternative.

3.7.2.2 Action Alternatives – 2, 3, and 4

Implementation of the proposed Action Alternatives will not have direct, indirect or cumulative impact on the United States. An estimated 50 workers, mainly Baja California residents, will be employed during construction. The influx of jobs to the Rosarito area due to the implementation of the proposed Action Alternatives, although relatively low compared with the total employed population in Rosarito, may minimally impact the economy of the study area.

The number of jobs generated from the proposed projects would be minimal, and it is unlikely that a large number of workers and their families would relocate to the region as a result of the implementation of the proposed actions. Therefore, the regional population would not be impacted. Improvements to the wastewater treatment system may create a more desirable place to live, which could result in a slight increase in population, but this increase would likely be insignificant.

The implementation of the proposed Action Alternative would have minor positive impact on the Playas de Rosarito economy. Under the implementation of the Action Alternative, the number of temporary jobs that the project would generate would be relatively low. It is speculated that the local labor is sufficient, and relocation of construction workers from other areas would not be required; consequently, the housing demand will remain unaffected.

3.8 PUBLIC HEALTH

Environmental health issues are by far the most pressing problems in the border area, including poor air quality, water scarcity and contamination, lead contamination, and improper waste disposal to name a few. Water is the most precious resource in a large portion of the border that is primarily arid.[18]

The wastewater generated in the unserved areas of established housing is either untreated or inadequately treated. Most of the untreated wastewater seeps into the ground as a result of cesspools and discharges to open ditches.

The ever-growing population in the border region of Baja California, Mexico, and California, in the United States has dramatically increased the utilization of marine resources and the types and amounts of contaminants produced and released to streams, rivers and the Pacific Ocean waters. These contaminants stem from sewage discharges, land runoff, industrial disposal, agricultural waste, and petroleum waste among others. Sewage, particularly, if partially treated or untreated, brings high microbe concentrations into the ocean[19].

It is speculated that wastewater runoffs into the intermittent streams eventually reach the Pacific Ocean and diluted with ocean waters at the discharge point (Rosarito beach). Additionally, it is anticipated that these ocean waters containing certain waterborne pollutants move to the north through marine currents into the U.S. territory.

Although winds and ground and surface water direction disperse odors and contaminants away from the area of concern, untreated wastewater has the potential to support a variety of microscopic and submicroscopic organisms and parasites, resulting in infectious and communicable diseases, many of which are potentially fatal.

Human diseases can be caused by waterborne pathogens that contact the skin or eyes; waterborne pathogens that are accidentally ingested when water is swallowed; or food borne pathogens found in the tissues of fish and shellfish consumed as seafood.
Beach pollution consequently is a persistent public health problem. Cumulatively, swimming advisories and beach closings are experienced because high levels of disease-causing microbes are found in the water. It is anticipated that untreated wastewater could be responsible for potential harmful microbial levels.[20]

Some common microorganisms found in domestic wastewater and the diseases associated with them are presented in Table 3-6.

Table 3-3. Infectious Agents Potentially Present in Untreated Domestic Wastewater

Organism Bacteria	**Disease Caused**
Escherichia coli (enterotoxigenic)	Gastroenteritis
Leptospira (spp.)	Leptospirosis
Salmonella (=2,100 serotypes)	Salmonellosis

[18] Pan American Health Organization, Health in the Americas, 2007. Volume II - Countries http://www.fep.paho.org
[19] Water Encyclopedia Ocean Pollution www.waterencyclopedia.com/Po-Re/Pollution-of-the-Ocean-by-Sewage
[20] Water Encyclopedia Ocean Pollution www.waterencyclopedia.com/po-re/pollution-of-the-ocean-by-sewage

Bacteria	Disease Caused
Shingella (4 spp.)	Shingellosis (bacillary dysentery)
Vibrio cholerae	Cholera
Protozoa	
Balantidium coli	Balantidiasis
Cryptosporidium parvum	Cryptosporidiosis
Entanoeba histolyca	Amebiasis (amoebic dysentery)
Giardia lamblia	Giardiasis
Helminths	
Ascaris lumbricoides	Ascariasis
T. solium	Taeniasis
Trichuris trichiura	Trichuriasis
Viruses	
Enteroviruses (72 types, e.g., polio, echo, and coxsackie viruses)	Gastroenteritis, heart anomalies, meningitis
Hepatitis A virus	Infectious hepatitis
Norwalk agent	Gastroenteritis
Rotavirus	Gastroenteritis

Source: EPA Municipal Technologies Fact Sheets

People may become ill by drinking water contaminated with these organisms or parasites, by eating raw or undercooked food that have been in contact with contaminated water, and by poor personal sanitation that allows the spread of diseases either directly or indirectly through inter-human contact. Current health concerns are associated with discharges of raw sewage in the neighborhoods, either from failing septic tanks or open cesspools.

Intestinal diseases that may be caused by coliform pathogens are the most common agent of disease worldwide. In rural areas of Mexico, where untreated wastewater is used for irrigation, different studies show that a significant percentage of the population in those areas has intestinal diseases.

The potential risk to human health in the area of concern is exhibited by data that indicates that residents from rural and semi-rural Mexican border communities were almost three times as likely to die from communicable diseases as residents of the United States border communities between 1990 and 1994, according to information from the Pan American Health Organization.

The close association between the population of the area of study and the significant number of tourists traveling to Tijuana, Playas de Rosarito, and other cities in Baja California is of certain concern. The potential communicable infectious diseases originating in untreated wastewater in Playas de Rosarito would not only affect the local residents but also potentially impact the continuous traffic of tourists in the area.

3.8.1 Environmental Consequences for Public Health

3.8.1.1 No Action Alternative – 1

The health risk effect for waterborne disease in the area of concern would continue at current levels, or could increase with the implementation of the No Action Alternative.
In the long-term, waterborne disease outbreaks could increase in the area of concern because of the expected increase in population and the lack of efficient wastewater treatment systems. Because the current available wastewater treatment system is not sufficient for existing demand, implementation of the

No Action Alternative could result in a potential long-term negative indirect impact to public health in the area of concern. This could have direct impacts to US public health as US residents frequently visit Rosarito.

US residents may be exposed to contamination through water consumption or direct contact in the ocean. Indirect impacts could occur if US residents that got sick from exposure to raw sewage in Rosarito spread disease in the US upon their return. Due to the frequency of US-Mexico border crossing, the public health in the US is at risk under the No Action Alternative, although effects would not likely cause any major health problems for the US.

Implementation of the No Action Alternative would result in a continuation of public health and safety concerns within the project area in Playas de Rosarito municipality. Insufficient wastewater collection and treatment systems, adding the improper maintenance of septic tanks, and the continued use of cesspools would likely result in additional sewage overflow in the communities that might potentially reach the ocean through intermittent streams. Other potential negative impacts to public health in the area of concern may increase during the rainy season, as the latrines and waste ditches may overflow. This would cause wastewater to reach streets and roads, potentially spreading bacteria and parasites. Cumulatively, implementation of the No Action Alternative may adversely impact public health, decreasing the quality of life among existing and future residents.

3.8.1.2 Action Alternatives – 2, 3, and 4

The proposed action could result in indirect transboundary benefits to US public health and the border economy. There are frequent border crossing between the US and the Tijuana-Playas de Rosarito region. Public health in the US could improve because US visitors to Rosarito would not be exposed to discharges of raw sewage. The border economy could also indirectly benefit as a result of better overall health conditions in Rosarito. The potential health threat associated with traveling to Rosarito would be reduced and more US residents may choose to cross the border. This could increase economic activity in the border region of the US.

Implementation of the proposed projects would likely decrease the health risk in the area of concern. Untreated wastewater supports a variety of organisms that can cause infectious diseases. Potentially contaminated surface water and groundwater resulting from the leakage and infiltration from failing septic tanks and cesspools would be alleviated with the expansion of wastewater treatment resources.

Under the proposed Action Alternatives, treated effluent will be disinfected by different processes (chlorine or UV radiation) eliminating present bacteria prior to discharging effluent to the Arroyo Huahuatay and subsequently into the Pacific Ocean.

3.9 CUMULATIVE IMPACTS

The combined, incremental effects of human activity, referred to as cumulative impacts, pose a threat to the environment. While they may be insignificant by themselves, these impacts accumulate over time, from one or more sources. The cumulative impacts of an action are the total effects on a resource, ecosystem, or human community of that action no matter what entity (federal, non-federal, or private) is taking the actions.[21] Because federal projects cause or are affected by cumulative impacts, they must be assessed in documents prepared under the National Environmental Policy Act.

[21] Considerations of Cumulative Impacts in EPA review of NEPA documents www.epa.gov/compliance/resources/policies/nepa/

3.9.1 Overview of Cumulative Impacts on the U.S./Mexico Border Areas

Urban populations along the border have increased significantly over the past 20 years, due in part to the maquiladora program begun in 1965, which provided economic incentives to foreign (mostly U.S.-owned) assembly plants located in the border region, and the North American Free Trade Agreement (NAFTA). Compared to other regions of Mexico, unemployment rate is low and wages are high along the Mexican border region. While economic growth has contributed to employment, the region's infrastructure has not kept up. As a result, natural resources are strained, and the environment and public health are adversely affected on both sides of the border.[22]

Rapid population growth has also led to increased demand for land, resulting in poorly planned development, greater demand for energy, amplified traffic congestion and waste generation, as well as overburdened or unavailable waste treatment and disposal facilities. Rural border communities are also confronted with illegal dumping, agricultural drainage, airborne dust and pesticides exposure, inadequate water supplies, insufficient or nonexistent waste facilities and degradation of natural resources and ecosystems. Because of regional environmental degradation, many border residents suffer from environmental health problems, including waterborne and respiratory diseases. The elderly and children are especially at risk, as well as residents in rural communities, as they are more likely to have inadequate water supply and treatment systems.[23]

3.9.2 Tijuana, Playas de Rosarito, and San Diego County

Population

In order to prepare for the cumulative effects, the population growth of the areas of concern must be considered, including the temporary visitors during summer and vacation breaks, the present and developing industry, as well as commerce and tourism facilities. The current water supply and wastewater treatment capacity have to be compared to the projected growth of population. It is important to mention that water supply and treatment is not only limited by the availability of the natural resources, but also by the access to infrastructure. The projected increase of inhabitants of the area of concern will require a major supply of drinking water; therefore, wastewater generation will also increase.

Between 1995 and 2000, Tijuana observed an annual growth rate of 4.7 percent, while Playas de Rosarito grew at a rate of 5 percent. It is estimated that the dynamics of the population growth of Playas de Rosarito will resemble that of Tijuana in the future. (CDM 2003). The CONAPO (Consejo Nacional de Población) in Mexico has estimates of population growth up to the year 2030.
According to their data, Tijuana will reach 2,171,753 inhabitants by 2020, however, the CONEPO along with the CESPT "Indices de Gestion" (*Basic Utility Information Sheet*) of December 2007 have already documented that current Tijuana and Rosarito metropolitan area population has been estimated in 1,941,204. Playas de Rosarito stand-alone estimation shows a population of 91,722 inhabitants by 2010, and 139,308 in 2020.

However, studies on cumulative impacts should consider the population growth of the entire region, including the other state municipalities, especially in Mexicali, since they share the same drinking water source as Tijuana and Playas de Rosarito, the Colorado River. Population in the U.S. side of the border will reach 3,381,918 inhabitants in San Diego County including, according to EPA medium estimates calculated by the Southwest Center for Environmental Research and Policy.[24]

[22] U.S. - Mexico Border 2012 Program http://www.epa.gov/usmexicoborder/framework/people.html#popgrowth
[23] U.S. - Mexico Border 2012 Program http://www.epa.gov/border2012/issues.html
[24] Southwest Consortium for Environmental Research and Policy, (SCERP) Population Projections http://www.scerp.org/

3.9.3 Effects of Alternatives on the Environment

Under the No Action Alternative, no improvements would be made to the current wastewater treatment systems; some communities would remain unserved, and population and wildlife would continue to be exposed to raw sewage and its health risks. Untreated water would reach streams, rivers, groundwater reserves, and potentially the Pacific Ocean, affecting nearby natural habitats, and increasing the amount of diseases. The U.S. population would also be affected by the daily border-crossing traffic of workers and visitors, increasing the risk of spread of disease on both sides of the border.

Depending on the Action Alternative to be implemented throughout the area of concern, there would be many positive, direct and indirect, impacts on the environment. These would include improvement of the quality of life for residents of Tijuana and Playas de Rosarito and neighboring communities. The construction and enhancements to the wastewater collection system within the area of concern would provide additional water treatment services to fulfill the increasing needs in Tijuana and Playas de Rosarito. Cumulatively, these projects would improve the quality of the water along water bodies in Mexico and the U.S. such as the Arroyo Huahuatay and the Pacific Ocean. Biological resource conservation would also be improved by reducing untreated wastewater discharges, thus, improving the conditions of the nearby ecosystems and its local and migratory species.

There are several wastewater infrastructure projects being considered or implemented in Rosarito and Tijuana. First, four new wastewater treatment plants are being constructed in the Tijuana watershed and coastal areas, referred to as the Japanese Credit Bank plants. These plants will provide much needed additional treatment capability and will improve the quality of wastewater discharges. CESPT is currently is construction a project that would discharge treated effluent from the Japanese credit plants into the Pacific Ocean off Mexico's coast. Effluent discharge flow from the La Morita and Monte de los Olivos plants into the ocean would be a maximum of 16.7 mgd (733 L/s) by the year 2025. In addition to the projects mentioned above, the Rosarito Norte, Rosarito I and Tecolote la Gloria WWTP will discharge into the Pacific Ocean approximately 13.8 mgd (610 l/s) all together by the year 2025. These additional discharges could affect water quality of coastal areas of the U.S. Additional effluent discharged into the ocean as a result of this project would not be of sufficient quantity to affect U.S. coastal resources under the cumulative condition.

Economy and health would also be improved throughout the region. The economy will be greatly improved by the influx of additional tourists that will be drawn by the improvement in the quality of water and decrease in the potential for waterborne diseases. The construction and improvement of wastewater systems would prevent the local communities and visitors from exposure to raw sewage and untreated wastewater, in addition, contamination of drinking water lines and wells would be avoided, resulting in a decreasing amount of people getting infectious diseases caused by waterborne parasites.

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5.0 ACRONYMS

ACHP	Advisory Council on Historic Preservation
AGI	Agricultural Irrigation
AGL	Agricultural and Livestock
AHPA	Archeological and Historic Preservation Act
ALK	Alkalinity
AID	Agency for International Development
a.m.	ante meridiem
A&W	Aquatic and Wildlife
A&We	Aquatic and Wildlife cold water
A&Ww	Aquatic and Wildlife warm water
AQCR	Air Quality Control Region
ARB	Air Resource Board
BCC	Birds of Conservation Concern
BECC	Border Environment Cooperation Commission
BEIF	Border Environment Infrastructure Fund
BMPs	Best Management Practices
BOD	Biological oxygen demand
C	Candidate
C^{O}	Degree Celsius
Ca	Calcium
CAA	Clean Air Act
CARB	California Air Resources Board
CDM	Camp Dresser & McKee Inc.
CEC	Commission for Environmental Cooperation
CEQ	Council on Environmental Quality
CESPT	Commisión Estatal de Servicios Públicos de Tijuana
CFU	Colony Forming Units
CFU/100ml	Colony Forming Units per 100 mililiters
CFR	Code of Federal Regulations
CG	Conventional Gravity
Cl	Chloride
CO	Carbon monoxide

COD	Chemical Oxygen Demand
CONEPO	Consejo Estatal de Poblacion
CONAGUA	Comision Nacional de Agua
CNA	Comision Nacional del Agua (National Water Commission)
CWA	Clean Water Act
CWS	Community Water Systems
dB	decibels
dB Leq	decibels equivalent sound level
dBA	decibels A-weighted
BOD^5	Biochemical Oxygen Demand
DFG	Department of Fish and Game
DO	Dissolved Oxygen
DWS	Domestic Water Source
E	Endangered
EA	Environmental Assessment
EAP	Economically Active Population
E. Coli	Escherichia coli
EID	Environmental Information Document
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FBC	Full Body Contact
Fe	Iron
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FNSI	Finding of No Significant Impact
FR	Federal Register
FSN	Fixed Station Network
FWCA	Fish and Wildlife Coordination Act
FWPCOA	Federal Water Pollution Control Act
gal/min	Gallon/minute
gmp	Gallons per minute
GIS	Geographic Information System

HR	Highly Restricted
HS	Hydrogen Sulfide
HC	Hydrocarbons Hr
IAQCR	Intrastate Air Quality Control Regions
IBC	International Boundary Commission
IBEP	Integrated Border Environmental Plan
INAH	Instituto Nacional de Antropologia
INE	Instituto Nacional de Ecologica
IBWC	International Boundary of Water Commission
in	inches
INEGI	Instituto Nacional de Estadistica Geografia e Informacion
K	Potassium
km	Kilometer
Km^2	Square Kilometers
L	Liter
lps	Liters per second
m	Meters
mm	millimeter
m^3	cubic meter
MBTA	Migratory Bird Treaty Act
MCL	Minimum Contamination Level
mg/l	Milligrams per liter
mgd	Million gallons per day
MIA	Manifestacion de Impacto Ambiental
ml	Milliliters
ml/1	Milliliters per liter
msl	Mean sea level
MSCP	Multiple Species Conservation Program
MWWD	Metropolitan Wastewater Department
Na	Sodium
NAAQS	National Ambient Air Quality Standards
NADBank	North American Development Bank
NAFTA	North American Free Trade Agreement
NBEP	Northern Border Environmental Program

NERR	National Estuarine Research Reserve
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NOM	Norma Oficial Mexicana
NNS	No Numeric Data
NPS	National Park Service
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source performance standards
NTU	Nephelometric Turbidity Units
NWPCP	National Wetlands Priority Conservation Plan
O_3	Ozone
Pb	Lead
PBC	Partial Body Contact
PER	Preliminary Engineering Report
pg/m^3	Micrograms per cubic meter
pH	Measure of acidity
p.m.	post meridiem
PLC	Programmable logic controller
PM10	Particulate matter under 10 micorns
POTWs	Publicity Owned Treatment Works
ppm	Parts per million
PSD	Prevention of Significant Deterioration
PSI	Pollutant Standard Index
R.C.	Rio Colorado
SA	Salvage assessed
SDG	Small Diameter Gravity
SEMARNAT	Secretaria de Medio Ambiente y Recursos Naturales
SBIWTP	International Water Treatment Plant
SBOO	South Bay Ocean Outfall
SDAB	San Diego Air Basin
SDCWA	San Diego County Water Authority

SDSU	San Diego State University
SHPO	State Historic Preservation Officer
SNA	State Natural Area
SO_2	Sulfur Dioxide
SO_4	Sulfate
SPC	Species of concern
Sr	Strontium
SSC	Species of Special Concern
STAT	Statute
SWMU	Surface water monitoring units
TDS	Total Dissolved Solids
T	Threatened
TSP	Total Suspended Particles
TSS	Total Suspended Solids
U.S.	United States
USC	United States Code
USDOC	United States Department of Commerce
USDOE	United States Department of Energy
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UV	Ultraviolet
VOCs	Volatile organic compounds
XMS	Transmissivity
W	Water Alternatives
WA	Wilderness Act
WMA	Wildlife Management Area
WQA	Water Quality Act
WTP	Water Treatment Plant
WW	Wastewater
WWCS	Wastewater Collection System
WWTP	Wastewater Treatment Plants

6.0 APPENDIX A - WILDLIFE AND THREATENED AND ENDANGERED SPECIES

6.1 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

The origin of the fauna in Baja California is directly related to the climatic changes during the tertiary era, particularly during the glacial periods, causing modification in the distribution of the flora, therefore, the fauna distribution changed as well.

The Baja California Peninsula consists of five districts for the fauna, one of them located in Baja California Sur, and the other four in the Baja California State. The area of concern falls within the regions described below.

The San Pedro Martir District is formed by a stretch belt located through the Sierra de Juarez and San Pedro Martir, reaching the 1,200 meters over the sea level at the occidental size and 1,400 to 1,500 at the oriental size. It abuts the U.S. to the north. Some of the characteristic species of the area include: Baja California rattlesnake (Crotalus enyo), Western rattlesnake (Crotalus viridus), Peninsular Bighorn sheep (Ovis canadiensis cremnobates), mule deer (Odocoileus hemionus), red-tailed hawk (Buteo jamaicensis), cougar (Felix concolor) and gray fox (Urocyon cinereoargenteus).

The San Dieguense District is located in the Northwest part of the state, including a section of the South California area. This region reaches the 1,200 meters over sea level by the Sierra de Juarez and 1,400 meters on the San Pedro Martir area, going south up to the Rosario arroyo. Some of the common species in this district are coast horned lizard (Phrinosoma corohatum), pine snake (Pituophis melanoleucus) common teal (Anas crecca), northern pintail (Anas Acuta), American wigeon (Anas americana), northern shoveler (anas clypeata), cinnamon teal (Anas cyanoptera), blue winged teal (Anas discors), mallard (Anas platynhynchos), gadwall (Anas strepera), california quail (Lophortix california), white-winged dove (Zenaida asiática), mourning dove (Zenaida macroura), coyote (Canis latrans), San Quintin kangaroo rat (Dipodomys gravipes), and kangaroo rat (Dipodomys merriam).[25]

6.1.1 Invertebrates

Invertebrates, which include intertidal organisms such as aquatic insects, worms, clams, and crabs, and terrestrial insects and spiders, are likely major consumers in the salt marsh food chain and in turn are an important food source for the fishes and birds of the marsh (Zedler, 1982d).

Crabs are perhaps the most conspicuous invertebrates in southern California coastal salt marshes. This is also true of the Tijuana Estuary. Burrows of several species of crab occur throughout the lower marsh. Another common and relatively conspicuous inhabitant of the estuary's tidal channels is the horn snail. Many other invertebrate species are just as numerous but less obvious because of their size or location within the sediments. These include several species of clams and mud worms.

Continuing recent studies have helped characterize the benthic community at the Tijuana Estuary. The species composition and dominance change with the distance from the River's mouth. Captellid and spionid polycheates are found in both the estuary's northern and southern arms. Protothaca staminea and Tagelus californianus are the most common bivalves in the tidal channels (Williams et al 1996). California horn snail (Cerithidea californica) is abundant especially in the winter.

[25] Baja California Government www.Baja California.Gob.Mx/Portal/Nuestro_Estado/Recursos/Fauna.Jsp

Relatively little research has been done on the terrestrial invertebrates of the estuary and their ecological role, except for the recent work on invasive Argentine ants. This non-native species forms extremely aggressive colonies, forcing out native ants and depleting the key food source of the horned lizard, which des not eat the Argentine ants. Installation of new irrigation lines has been blamed for Argentine ant invasion, as the ants require a year-round water source. In general, as in other salt marshes, most insects here probably feed on vascular plants, algae, and decaying plants, while others are carnivores. They serve as a food source for birds and other marsh vertebrates. Marsh insects are also important to the pollination of marsh flowering plants. The endangered salt marsh bird's beak, for example, is pollinated by native bees (Zedler, 1982d).

Rove beetles (Staphylinidae) burrow in mud and salt flats. They are abundant in the estuary and appear to play a role in aerating soils and in reversing soil compaction resulting from off-road vehicles. Studies suggest that the largest population of the wandering skipper (Panoquina errans) in the United States may be at the Tijuana Estuary (Zedler, 1982d). The estuary also supports a diverse and abundant population of coastal tiger beetles (Cicindela sp.), of which four species may be threatened (U.S. Fish and Wildlife Service, 1982). The Reserve is also a location for the globose dune beetle (Coelus globosus), a federal Category 2 species.

At least 11 species of salt marsh mosquitoes breed in the saline and brackish pools of the estuary (U.S. Fish and Wildlife Service, California Department of Parks and Recreation, and Department of the Navy, 1983). Three species (Aedes taeniorhynchus, Anopheles hermsi, and Culex tarsalis) are of particular concern because of their potential as pests and possible disease vectors. Currently, biochemical control methods are being used to combat larvae and adults in areas where there is a high concentration of these mosquitoes.

6.1.2 Fish

The small tidal creeks and channels of the estuary support a relatively diverse population of fish including at least 29 species representing 19 families (U.S. Department of Commerce and California Coastal Commission, 1981; U.S. Fish and Wildlife Service, 1982, Zedler et al. 1992). Since 1987, fish assemblages have been sampled in the estuary. Catches are often dominated by topsmelt (Atherinops affinis), longjaw mudsucker (Gillichthys mirabilis), arrow goby (Clevelandia ios), and California killifish (Fundulus parvipinnis). Adult striped mullet (Mugil cepalus) are also common. Abundance varies year to year, but total density tends to peak in the summer and declines in the winter.

The tidal channels have been shown to function as a nursery for commercially important fish, such as the California halibut. Nordby (1982) found abundant eggs of the croaker family, topsmelt, and northern anchovy. Hence, the estuary appears to be providing nursery habitat for marine fishes; therefore, it may be important for sport and commercial fisheries. Game fish such as kelp and sand bass (Paralabrax spp.), opaleye (Girella nigricans), and white croaker (Genyonemus lineatus) have also been found in the estuary (U.S. Department of Commerce and California Coastal Commission, 1981).

6.1.3 Reptiles and Amphibians

The habitats within the Reserve support at least 29 species of reptiles and amphibians (Espinoza 1991, USGS 2001). These include the San Diego horned lizard (Phrynosoma coronatum blainvillei), and the Coronado skink (Eumeces skiltonianus interparietalis). Both are species of special concern.

California kingsnakes (Lampropeltis getulus californiae) and San Diego gopher snakes (Pituophis melanoleucus annectens) are common in transitional habitats, but are also found in the drier areas of the

salt marsh. Side blotched lizards (Uta stansburiana) are abundant on the dry ground of the reconstructed dunes and other sandy areas. Dunes are also home to the San Diego horned lizard and silvery legless lizard (Annielia pulchra pulchra).

Riparian area and freshwater ponds are home to the California toad (Bufo boreas halophilus) and the Pacific tree frog (Hyla regilla). Coastal sage scrub is habitat for the San Diego alligator lizard (Gerrhonotus multicarinatus webbi) and the Great Basin fence lizard (Sceloporus occidentalis biseriatus).

Management of reptiles and amphibians focuses on protecting the remaining open space in the Reserve and restricting horse, vehicle, and foot traffic to designated areas. The maintenance of the few freshwater ponds is important to life cycles of the amphibians (Espinoza 1991).

6.1.4 Birds

Southern California's bird populations have been an important factor in the special protective status attributed to the Tijuana Estuary. Over 370 bird species are reported for the area. Birds use the side array of habitats present in the lower and upper estuary, including the ocean beach and dunes, mudflats, mudbanks, salt marshes, and riparian areas.

Six federally listed threatened or endangered birds occur regularly in the Reserve: the light-footed clapper rail (Rallus longirostris levipes), the California least tern (Sternulae antillarum), least Bell's vireo (Vireo belli pusillus), the California gnatcatcher, the western snowy plover (Charadrius alexandrinus nivosus), and the California brown pelican (Pelecanus occidentalis californicus). Belding's sparrow (Passerculus sandwichensis beldingi) is listed as endangered in the State of California. Other regionally or locally rare species include the elegant tern (Sterna elegans), black skimmer (Rynchops niger), and northern harrier (Circus cyaneus). The light-footed clapper rail (Rallus longirostris levipes), California least tern (Sterna antillarum browni), western snowy plover (Charadrius alexandrinus nivosus), least Bell's vireo (Vireo bellii pusillus), and Belding's Savannah Sparrow (Passerculus sandwichensis beldingi) nest in the estuary.

The decline of the light-footed clapper rail population in southern California is associated with the encroachment and destruction of coastal salt marshes. Recent censuses indicate that the entire U.S. population of this subspecies may be as low as 325. In recent years, 80-90 pairs were recorded at the Tijuana Estuary, making it the second largest population of this endangered species in the United States.

A total of 305 California least tern pairs were reported in the Reserve for 2006, with 57-80 chicks fledged. Fences and temporary enclosures have been built to protect the nesting areas. However, nests and fledglings are vulnerable to vehicle, horse, and foot traffic on the beach. Tern reproduction can be severely impacted by predation from an array of predator species.
A small number of western snowy plover also nest in the river mouth areas and dunes from mid-March to mid-September. Peak nesting occurs from April through June. A total of 16 nests were attempted in 2006 with about five chicks fledged. Nest success, formerly reduced by trampling by undocumented immigrant traffic, is now limited by avian predators, such as gull-billed terns (Sterna nilotica vanrossemi), and extremely rare federally listed species.

Belding's Savannah sparrow uses the higher salt marsh habitats, particularly pickleweek communities, for nesting. Nesting occurs anywhere from March to August (Masey, 1979). In 2006, 169 Belding's savannah sparrow territories were found in the Oneonta Lagoon section north of the River, and 105 were found south, although the extreme southern portion of the wetland below the beach trail were not surveyed. The long breeding season of this species, coupled with its sensitivity to disturbance, requires that human activities in the upper marsh be restricted for most of the year to avoid further declines in the population (Zedler, 1982b).

Least Bell's vireo nests in the riparian vegetation adjacent to intermittent streams and channels of the Tijuana River. Willow thickets are the main territorial sites both in the southern and eastern portions of the Reserve. A 2004 survey found there were approximately 300 pairs of least Bell's vireo in the Valley, with nine pairs in Goat Canyon.

The Tijuana River Estuary is located along the Pacific Flyway and is used for migration and wintering habitat for a variety of waterfowl and shorebirds. Wintering waterfowl include pintail (Anas acuta), cinnamon teal (Anas cyanoptera), American widgeon (Anas americana), surf scoter (Melanitta perspicillat), and ruddy duck (Oxyura jamaicensis). Reserve wetlands are important habitats for a large number of shorebirds (shorebirds account for the majority of the migratory bird population).While about 20 species occur regularly along the sand flats and mudflats of the estuary, four species – willet (Catoptrophorus semipalmatus), dowitcher (Limnodromus spp.), western sandpiper (Calidris mauri), and marbled godwit (Limosa fedoa) – account for most of the shorebird population throughout the year (Boland, 1981).
Abundance and species composition fluctuate seasonally. Intertidal sand and mudflats support the largest numbers of individuals and species.

6.1.5 Mammals

In Southern California, the estuary supports a mammal population typical of fields and lowland habitats. Rodents, including mice, the California ground squirrel, and rabbits are most common, providing an important food source for the raptor population of the upper estuary. Coyotes, raccoons, bobcats, striped skunks, and long-tailed weasel are present in the Reserve (Taylor & Tiszler, 1989). The San Diego black-tailed jackrabbit, a California species of special concern, inhabits the southern portion of the Reserve.

7.0 APPENDIX B REGULATORY DRIVERS AND GUIDANCE

The purpose of this appendix is to summarize international agreements and U.S. and Mexican environmental protection regulations applicable to this EA.

International Agreements

The BECC BEIF Environmental Assessment Guidelines identify and describe the following five major bilateral agreements between Mexico and the U.S. related to environmental protection:

- The 1889 International Boundary Convention
- The Water Treaty of 1944
- The 1983 La Paz Agreement (or Border Environmental Agreement)
- The 1992 Integrated Border Environmental Plan (IBEP)
- The 1994 North American Free Trade Agreement (NAFTA)

"The 1889 International Boundary Convention established the International Boundary Commission (IBC). The Water Treaty of 1944 replaced the IBC with the International Boundary and Water Commission (IBWC) and granted the U.S. Section of the IBWC enhanced authority to address water quality, conservation, and use issues within the U.S. All international border and water treaties with respect to Mexico are coordinated through the IBWC. "

"The IBWC was created by the governments of the U.S. and Mexico to apply the provisions of various border and water treaties and settle differences arising from such applications through a joint international commission. IBWC coordinates the exchange of information between the U.S. and Mexico for all program activities that involve watersheds or aquifers crossing into Mexico. The IBWC jurisdiction extends along the U.S./Mexico International Border, and inland into both countries where international border and water projects may exist. The IBWC has encouraged and coordinated the establishment of cooperative relationships with federal, state, and local agencies, both in the U.S. and Mexico, in carrying out its border projects and activities."

The 1944 Treaty also specifies the way in which water rights of the Rio Grande, from Fort Quitman in Texas to the Gulf of Mexico, are allotted. In summary, the Treaty states that all of the water reaching the Rio Grande from the San Juan and Alamo Rivers belongs to Mexico, as wells as two thirds of the flow from the Conchos, San Diego, San Rodrigo, Escondido, and Salado rivers and Las Vacas Arroyo. Flows not-allotted by the treaty are equally owned by both countries.

The "Agreement for the Protection and Improvement of the Environment in the Border Area", known as La Paz Agreement, was signed in 1983. The main objective of the Agreement is to protect, improve, and conserve the environment of the border area. The La Paz Agreement defines the border region as the area lying 100 km (62 miles) to the north and south of the U.S./Mexico International Border. In 1992, the IBEP was released, and building on this, the Border XXI Program increased the scope of concern to include environmental health and natural resources issues.

"As part of NAFTA, a bilateral agreement was signed to address the deficiencies in water and wastewater infrastructure in the border area. A second environmental agreement negotiated to augment NAFTA is the 1994 U.S./Mexico Agreement Concerning the Establishment of a BECC and a NADB (BECC-NADB Agreement). The BECC-NADB Agreement targets certain environmental problems in the border region

to remedy international border environmental or health problems. The BEIF was created by NADB and EPA to make environmental infrastructure projects affordable for communities throughout the U.S./Mexico border region by combining grant funds with loans or guaranties for projects that would otherwise be financially unfeasible."

U.S. National Environmental Policy Act of 1969

NEPA was passed in 1969 "to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment." NEPA requires all federal agencies to prepare Environmental Information Documents (EIDs), EAs and/or Environmental Impact Statements (EISs) to assess environmental impacts from project alternatives.

The purpose of NEPA is "to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality."

According to NEPA, it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources.

NEPA, as amended in 1970, requires federal agencies to: (a) utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment; (b) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will ensure that presently un-quantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations; (c) include in every recommendation a detailed statement on the environmental impact of the Proposed Action; any adverse environmental effects which cannot be avoided should the proposal be implemented; alternatives to the Proposed Action; the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and; any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented.

U.S. Air Regulations

The Clean Air Act (CAA) was enacted in 1970 to address air pollution at the federal level. The CAA requires the EPA administration to set national ambient air quality standards and emission standards. Furthermore, the act established auto emission standards. Prior to the passage of the CAA, regulations for air quality control were defined and enforced at the state level. The CAA still allows states to have more stringent standards than those required by the federal government.

The CAA was amended in 1977. The amendment relaxed auto emission standards, and established provisions for the deterioration of areas. The CAA was further amended in 1990. The 1990 Clean Air Act provides for interstate commissions on air pollution control, which are to develop regional strategies for cleaning up air pollution. The 1990 Clean Air Act includes other provisions to reduce interstate air

pollution. The CAA also acknowledges that air pollution moves across national borders, and the law addresses pollution that originates in the U.S. and reaches Canada and Mexico.

The 1990 CAA Amendment also created the framework for the creation of a permit program for large point sources of air contaminants.

The CAA requires federal actions to conform to any state implementation plan approved or promulgated under Section 110 of the Act. For EPA actions, the applicable conformity requirements specified in 40 CFR Part 51, Subpart W; 40 CFR Part 93, Subpart B; and the applicable state implementation plan must be met. Under the Federal Rule on General Conformity, 40 CFR Part 93, a conformity determination is required only when emissions occur in a non-attainment area. Much of the work necessary to carry out the Clean Air Act is delegated to the states.

Mexican Air Regulations

Two air quality regulations and two noise regulations relevant to this EA have been incorporated into the *Normas Oficiales Mexicanas,* or Mexican Official Regulations:

- *Límites Máximos Permisibles de Emisiones para Vehículos con Gasolina,* or Maximum Permissible Emission Limits for Vehicles Using Gasoline (NOM-041-SEMARNAT-1999)
- *Límites Máximos Permisibles de Emisiones para Vehículos con Diesel,* or Maximum Permissible Emission Limits for Vehicles Using Diesel (NOM-045-SEMARNAT-1996)
- *Límites Máximos Permisibles de Emisión de Ruido de Vehículos Automotores,* or Maximum Permissible Emission Limits for Noise from Motor Vehicles (NOM-080-SEMARNAT-1994)
- *Emisiones de Ruido de Fuentes Fijas,* or Noise Emissions from Fixed Sources (NOM-081-SEMARNAT-1994)

U.S. Water Quality Regulations

The Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into the waters of the U.S. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for contaminants of concern in surface waters. The Act made it unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by non-point source pollution.

Mexican Water Quality Regulations

There are five water quality regulations relevant to this EA in the *Normas Oficiales Mexicanas,* or Mexican Official Regulations:

- *Limites Máximos Permisibles de Contaminantes en las Descargas de Aguas Residuales en Aguas y Bienes Nacionales*, or Maximum Permissible Limits of Contaminants in Wastewater Discharges into National Waters and Natural Resources (NOM-001-SEMARNAT-1996)

- *Límites Máximos Permisibles de Contaminantes Para las Aguas Residuales Tratadas que se Reusen en Servicios al Público*, or Maximum Permissible Limits of Contaminants for Treated Wastewaters that are Reused in Services to the Public (NOM-003-SEMARNAT-1997)

- *Límites Permisibles de Calidad y Tratamiento a que Debe Someterse el Agua Para su Potabilización,* or Permissible Quality and Treatment Limits for Potable Water (NOM-127-SSA1-1994)

- *Vigilancia y Evaluación del Control de Calidad del Agua Para Uso y Consumo Humano Distribuida por Sistemas de Abastecimiento Público,* or Monitoring and Evaluation of Quality Control of Water for Human Use and Consumption through Public Supply Systems (NOM-179-SSA1-1998)

- *Requisitos Sanitarios que Deben Cumplir los Sistemas de Abastecimiento de Agua para Uso y Consumo Humano Públicos y Privados,* or Sanitary Requirements to Which Public and Private Water Supply Systems for Human Use and Consumption Must Comply (NOM-012-SSA1-1993)

U.S. Biological Resource Regulations

The Endangered Species Act (ESA), 16 USC 1536 *et seq*., protects threatened and endangered plants and animals and their habitats. The U.S. Fish and Wildlife Service (USFWS) of the Department of the Interior implement the ESA at a national level. California Department of Fish and Game (DFG) implements the California ESA. DFG maintains a list of special status species within the state.

The law prohibits any action, administrative or real, that results in a "taking" of a listed species, or adversely affects habitat. Likewise, import, export, interstate, and foreign commerce of listed species are all prohibited.

In the context of this study, the ESA must be observed for any potential impacts to terrestrial habitat in the U.S. resulting from construction activities, as well as impacts to aquatic habitat resulting from changes in water quality.

Mexican Biological Resource Regulations

The *Norma Oficial Mexicana,* or Mexican Official Regulation having to do with protection of species is NOM-059-SEMARNAT-2001. The regulation includes a list of native Mexican species, and their status as either endangered, threatened, afforded special protection, or likely to be extinct. Of the 569 amphibians, birds, fungi, invertebrates, mammals, fish, plants, and reptiles listed, 104 are endangered, 164 are threatened, 10 are considered probably extinct, and the rest are afforded special protection.

Federal Cross-Cutting Laws and Regulations

National Natural Landmarks - The Secretary of the Interior is authorized to designate areas as National Natural Landmarks for listing on the National Registry of Natural Landmarks pursuant to the Historic Act of 1935, 16 U.S. Code (USC) 461 et seq. In conducting the environmental review of the Proposed Action, EPA is required to consider the existence and location of natural landmarks, using information provided by the National Park Service (NPS) pursuant to 36 CFR 62.6(d). The Tijuana River Estuary is a National Natural Landmark.

Cultural Resources Data - The Archeological and Historic Preservation Act (AHPA) of 1974, 16 USC 469 et seq. provides for the preservation of cultural resources if an EPA activity may cause irreparable

loss or destruction of significant scientific, prehistoric, or archeological data. In accordance with the AHPA, the responsible official or the Secretary of the Interior is authorized to undertake data recovery and preservation activities.

Cultural Resources - The *National Historic Preservation Act* (NHPA), as amended, 16 SC. 470, directs federal agencies to integrate historic preservation into all activities which either directly or indirectly involving land use decisions. The NHPA is administered by the NPS, the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and each federal agency. Implementing regulations include 36 CFR Part 800: *Regulations of the Advisory Council on Historic Preservation Governing the NHPA Section 106 Review Process*. Section 106 of the NHPA requires federal agencies to take into consideration the impact that an action may have on historic properties which are included on, or are eligible for inclusion on, the National Register of Historic Places. The Section 106 review process is usually carried out as part of a formal consultation with the SHPO, the ACHP, and other parties, such as Indian tribes, that have knowledge of, or a particular interest in, historic resources in the area of the undertaking.

Wetlands Protection - EO 11990, "Protection of Wetlands" of 1977, requires federal agencies conducting certain activities to avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands, if a practicable alternative exists. Discharge of dredge or fill material into wetlands and other waters of the U.S. are also regulated under Section 404 of the Clean Water Act.

Floodplain Management - EO 11988, "Floodplain Management" of 1977, requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, any adverse effects associated with the direct and indirect development of a floodplain.

Coastal Zone Management Act - The Coastal Zone Management Act, 16 USC 1451 *et seq.,* requires that federal agencies in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. If an EPA action may affect a coastal zone area, the responsible official is required to assess the impact of the action on the coastal zone.

Fish and Wildlife Protection - The Fish and Wildlife Coordination Act, 16 USC 661 *et seq*., requires federal agencies involved in actions that will result in the control or structural modification of any natural stream or body of water for any purpose, to take action to protect the fish and wildlife resources that may be affected by the action.

Wilderness Protection - The Wilderness Act, 16 USC 1131 *et seq*., establishes a system of National Wilderness Areas. The act establishes a policy for protecting this system by generally prohibiting motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport. Otay Mountain Wilderness, designated in 1999, is the nearest wilderness site to the study area.

Environmental Justice - EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and the accompanying presidential memorandum, advise federal agencies to identify and address, whenever feasible, disproportionately high and adverse human health or environmental effects on minority communities and/or low-income communities.

8.0 APPENDIX C
AGENCIES AND PERSONS CONTACTED

Agency	Agency Contact	Summary of Comments
State Historic Preservation Office (SHPO)	Milford Donaldson	No comments provided
Coastal Commission	Sherilyn Sarb	No comments provided
US Fish and Wildlife Services (USFWS)	Ren Lohoefener	No comments provided