Draft

Supplemental Environmental Impact Statement Clean Water Act Compliance at the South Bay International Wastewater Treatment Plan

Prepared for:
UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION

In Cooperation with:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
PARSONS
Pasadena, California

December 2004

DRAFT
SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant

Prepared for:

UNITED STATES SECTION
INTERNATIONAL BOUNDARY AND WATER COMMISSION
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COVER SHEET

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
CLEAN WATER ACT COMPLIANCE AT THE
SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT
(X) DRAFT ( ) FINAL

Lead Agency

United States Section, International Boundary and Water Commission (USIBWC), El Paso, Texas

Cooperating Agency

United States Environmental Protection Agency (USEPA), Region 9, San Francisco, California

Abstract

Pursuant to Section 102(2) (c) of the National Environmental Policy Act of 1969, as amended, the United States Section, International Boundary and Water Commission (USIBWC) proposes to analyze and evaluate the impacts of alternatives for the South Bay International Wastewater Treatment Plant (SBIWTP) to achieve compliance with the Clean Water Act. The Draft Supplemental Environmental Impact Statement (SEIS) will evaluate alternatives for treatment of sewage flows from Tijuana, Mexico that cross into the United States along the United States/ Mexican border in San Diego County. The USIBWC is evaluating options for providing secondary treatment at the SBIWTP; or for another entity, either private or public, to provide secondary treatment, or by some other means.

The No Action Alternative and six action alternatives are evaluated in the Draft SEIS. The alternatives were developed in a manner that would enable wastewater flows to be treated in compliance with the Clean Water Act. Alternatives formulation was the result of a public consultation process that included regulatory agencies and environmental organizations.

The USIBWC has identified Alternative 4, Treatment Option C as the preferred alternative in this Draft SEIS. The USIBWC will consider comments on the Draft SEIS to identify the preferred alternative in the Final SEIS.

Other Requirements Served

This Draft SEIS is intended to serve other environmental review and consultation requirements pursuant to 40 CFR 1502.25(a).

Comments Submittal

Comments on this Draft SEIS should be directed to:

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Date Draft SEIS available to EPA and the Public

December 30, 2004

Date by Which Comments on the Draft SEIS Must be Received to be Considered in the Preparation of the Draft SEIS

February 28, 2005

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ANSI	American National Standards Institute
APCD	Air Pollution Control District
ASTM	American Society of Testing Materials
B.S.	Bachelor of Science
BAF	biologically aerated filter
bbl/d	barrels per day
BECC	Border Environment Cooperation Commission
Bkwh	billion kilowatt hours
BLM	U.S. Bureau of Land Management
BLM-OCS	U.S. Bureau of Land Management – Outer Continental Shelf
BOD	biochemical oxygen demand
BOD_5	5-day biochemical oxygen demand
BRI	benthic response index
BTEX	benzene, toluene, ethylbenzene and xylene
C	Centigrade
CAAQS	California ambient air quality standards
Cal/BECC	California Border Environmental Cooperation Committee
Cal/EPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CBOD	carbonaceous biochemical oxygen demand
CCA	California Coastal Act
CCC	California Coastal Commission
CCD	Coastal Consistency Determination
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDO	Cease and Desist Order
CEC	California Energy Commission
CEC	Commission for Environmental Cooperation
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERL	Construction Engineering Research Laboratory
CESA	California Endangered Species Act
CESPT	Comision Estatal de Servicios Publicos de Tijuana (State Commission of Public Services, Tijuana)
CESPTe	State Commission of Public Services Tecate
CFR	Code of Federal Regulations
CFU	Coliform forming units
cm	centimeter
CMA	completely mixed aeration
CMP	Comprehensive Management Plan

Acronym	Definition
CNA	Comisión Nacional del Agua
CNDDB	California National Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CODAR	Coastal Radar
CPD	Particular Conditions of Discharge (Mexican)
CPFV	commercial passenger fishing vessel
CPG	Certified Professional Geologist
CR	Code of Federal Regulations
CRETIB	corrosive, reactive, explosive, toxic, ignitable, or biologically infectious
CRWQCB	California Regional Water Quality Control Board
CUPA	Certified Unified Program Agency
CVMARC	Chula Vista Model Airplane and Radio Control Club
CWA	Clean Water Act
CWA	California Water Authority
CZMA	Coastal Zone Management Act
D/T	dilution to threshold
DAF	dissolved air flotation
dB	decibel
dBA	decibel A-weighted scale
DDT	dichlorodiphenyl-trichloroethane
DEH	County of San Diego Department of Environmental Health
DGE	Dirección General de Ecologia (Mexican Government Department of Ecology)
DHS	(California) Department of Health Services
DMRBI	Dairy Mart Road Bridge Improvements
DNL	Day-Night Average Sound Level
DO	Dissolved oxygen
DTSC	Department of Toxic Substances Control
E.O.	Executive Order
EA	Environmental Assessment
EDL	elevated data levels
EIA	environmental impact assessment
EID	Environmental Information Document
EIFS	Economic Impact Forecast System
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	(United States) Environmental Protection Agency
ERA	Environmental Risk Assessment
ESA	Endangered Species Act
ESA	Environmental Site Assessment
F	Fahrenheit
FEB	Flow Equalization Basin
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
FWS	Fish and Wildlife Service
GAPS	Grove Avenue Pump Station
gpm	gallons per minute
GW-hrs	Gigawatt-hours

Acronym	Definition
H_2S	hydrogen sulfide
ha	hectare(s)
HCH	hexachlorocyclohexane
HEC-RAS	Hydraulic Engineering Center–River Analysis System
HMD	Hazardous Materials Division
H.R.	House Rule
HUD	Housing and Urban Development
I-5	Interstate 5
IBWC	International Boundary and Water Commission
INE	Instituto Nacional de Ecologia
INS	U.S. Immigration and Naturalization Service
ITI	infaunal trophic index
ITP	International Treatment Plant
ITT	Instituto Technologico de Tijuana Ecology
IWTP	international wastewater treatment plant
km	kilometer(s)
km^2	square kilometer(s)
kWh	kilowatt hours
l/s	liter(s) per second
LCAN	Linear Construction Activity Notification
L_{eq}	Equivalent Sound Level
LGEEPA	Ley General del Equilibrio Ecologico y la Proteccion al Ambiente
LLC	Limited Liability Corporation
LOS	level of service
lps	liter(s) per second
LUP	Linear Underground/Overhead Project
m	Meters
m^3/sec	cubic meters per second
MAHL	maximum allowable headworks loading
µ	microgram
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MG	million gallons
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mgd	million gallons per day
MHHW	mean higher high water
MHPA	Multiple Habitat Planning Area
MIA	Manifestacion de Impacto Ambiental
mL	milliliters
MLLW	mean lower low water
MM	Modified Mercalli
mm^3	million cubic meters
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MPN	most probable number

Acronym	Definition
MRP	Monitoring and Reporting Program
MRZ	Mineral Resource Zone
MSCP	Multi-Species Conservation Plan
MSL	mean sea level
MW	megawatts
MWWD	(San Diego) Metropolitan Wastewater Department
NAAQS	National Ambient Air Quality Standards
NADBank	North American Development Bank
NAFTA	North American Free Trade Agreement
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
ng/L	nanograms per liter
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOLF-IB	Navy Outlying Field, Imperial Beach
NOM	Norma Oficial Mexicanas
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWR	(Tijuana Slough) National Wildlife Reserve
NWRS	National Wildlife Refuge System
O&M	operations and maintenance
OCA	offsite consequence analysis
OCC	Original Conveyance Channel
OHW	ordinary high water
ORPS	Otay River Pump Station
OSHA	Occupational Safety and Health Act
OU	odor unit
PA	Programmatic Agreement
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyls
PCL	parallel conveyance line
PERC	primary effluent return connection
PERL	Pacific Estuarine Research Laboratory
pH	measurement of the level of acidity or alkalinity of a substance
Ph.D.	Doctor of Philosophy
PLOO	Point Loma Ocean Outfall
PLWTP	Point Loma Wastewater Treatment Plant
PM_{10}	particulate matter less than 10 microns
ppb	parts per billion
pphm	parts per hundred million
ppm	parts per million
ppt	parts per thousand
PROFEPA	Procuraduria Federal de Protection al Ambiente
RAQS	Regional Air Quality Standards

Acronym	Definition
R.C.E.	Registered Civil Engineer
RECON	Regional Environmental Consultants
RMP	Risk Management Program
RMPP	Risk Management Prevention Plan
ROC	reactive organic compounds
ROD	Record of Decision
ROV	remotely operated vehicle
RTV	Rational Threshold Value
RV	recreational vehicle
RWQCB	(California) Regional Water Quality Control Board
SABWWTP	San Antonio de los Buenos Wastewater Treatment Plant
SANDAG	San Diego Association of Governments
SBIWTP	South Bay International Wastewater Treatment Plant
SBLO	South Bay Land Outfall
SBOO	South Bay Ocean Outfall
SBSTP	South Bay Secondary Treatment Plant
SBWRP	South Bay Water Reclamation Plant
SCAQMD	South Coast Air Quality Management District
SCCWRP	Southern California Coastal Waters Research Project
SCERP	Southwest Center for Environmental Research & Policy
SCT	Secretaria de Comunicaciones y Transportes (Secretariat of Communications and Transport)
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDG&E	San Diego Gas & Electric
SDM	Shore Discharge Model
SDREO	San Diego Regional Energy Office
SEDUE	Secretariat of Urban Development and Ecology
SEIS	Supplemental Environmental Impact Statement
SEMARNAP	Secretaria del Medio Ambiente Recursos Naturales y Pesca
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMW	State Mussel Watch
SO_X	sulfur oxides
STLC	soluble threshold limit concentration
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resource Control Board
Tcf	Trillion cubic feet
TCLP	toxicity characteristic leaching potential
TCM	transportation control measures
TDS	total dissolved solids
TEPH	total extractable petroleum hydrocarbon
TJVCWD	Tijuana Valley County Water District
TOC	Technical Oversight Committee
TOES	Tijuana Oceanographic Engineering Study
TPH	total petroleum hydrocarbon
TQ	threshold quantities
TRNERR	Tijuana River National Estuarine Research Reserve

Acronym	Definition
TRPH	total recoverable petroleum hydrocarbon
TSCA	Toxic Substances Control Act
TSNWR	Tijuana Slough National Wildlife Resume
TSP	total suspended particles
TSS	total suspended solids
TTLC	total threshold limit concentration
TVPH	total volatile petroleum hydrocarbon
U.S.C.	United States Code
USACE	United Stated Army Corps of Engineers
USDA	United States Department of Agriculture
USDOC	United States Department of Commerce
USEPA	United Stated Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USIBWC	United States Section, International Boundary and Water Commission
VOC	volatile organic compound(s)
WWTP	wastewater treatment plant
YMCA	Young Mens Christian Association
ZID	zone of initial dilution

EXECUTIVE SUMMARY

The United States Section, International Boundary and Water Commission (USIBWC) is analyzing the environmental impacts of alternatives for the South Bay International Wastewater Treatment Plant (SBIWTP) to achieve compliance with the Clean Water Act (CWA). Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended, this Draft Supplemental Environmental Impact Statement (SEIS) evaluates alternatives for treatment of sewage flows from Tijuana, Mexico that cross into the United States along the United States/Mexican border in San Diego County.

The SBIWTP, an international wastewater treatment plant located in San Diego County at the United States-Mexico border, plays a critical role in protecting public health and the environment of the south San Diego region. The SBIWTP treats an average of 25 million gallons per day (mgd) of raw sewage originating from Tijuana and then discharges the treated effluent approximately 3.5 miles out into the Pacific Ocean through the South Bay Ocean Outfall (SBOO). The SBIWTP and its system of canyon collectors prevent millions of gallons of dry weather flows of raw sewage from flowing daily from Mexico into the United States and polluting the Tijuana River, the Tijuana River Valley and Estuary, and south San Diego beaches.

The USIBWC has evaluated options for providing secondary treatment at the SBIWTP; or for another entity, either private or public, to provide secondary treatment, or by some other means. This action considers existing and new alternatives that would enable the USIBWC to bring the SBIWTP into compliance with the CWA and its National Pollutant Discharge Elimination System (NPDES) permit. This Draft SEIS evaluates new information on the current discharges of advanced primary effluent from the SBIWTP through the SBOO, as well as interim actions that would allow continued operations of the SBIWTP until the SBIWTP achieves CWA compliance. The alternatives were developed to enable the USIBWC to meet the purpose and need of this action and to guide USIBWC decision-making.

The No Action Alternative and six action alternatives were evaluated in this Draft SEIS. The alternatives were developed in a manner that would enable wastewater flows to be treated in compliance with the CWA. Alternatives formulation included the results of a public scoping process that involved regulatory agencies and environmental organizations.

PURPOSE AND NEED

The purpose of this action is to provide wastewater management facilities that safeguard the public health, environment, public beaches, water quality, and economy of San Diego, California and Tijuana, Baja California, in compliance with the CWA, including actions that would allow continued operations of the SBIWTP until the SBIWTP achieves CWA compliance.

This action is needed because the SBIWTP currently operates and discharges only at the advanced primary treatment level and cannot meet all the requirements of the CWA and its NPDES Permit, including secondary treatment requirements.

ALTERNATIVES CONSIDERED IN DETAIL

This Draft SEIS has been prepared to enable the USIBWC to identify the environmental effects of alternatives being considered for implementation. The USIBWC considered a range of reasonable alternative treatment and discharge options to comply with the CWA. This Draft SEIS evaluates the following seven alternatives and associated treatment or disposal options:

- **Alternative 1:** No Action (Operation of SBIWTP as Advanced Primary Facility)
  - Option A: With No Future Improvements to Mexico's Existing Conveyance Facilities
  - Option B: With Future Improvements to Mexico's Existing Conveyance Facilities
- **Alternative 2:** Operate SBIWTP as Advanced Primary Facility With Treated Flows Conveyed To Mexico for Discharge
- **Alternative 3**: Operate SBIWTP with City of San Diego Connections (Interim Alternative Only)
- **Alternative 4:** Public Law 106–457, Secondary Treatment Facility in Mexico
  - Treatment Option A: Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Treatment Option B: Cease Operation of SBIWTP, Secondary Treatment in Mexico
  - Treatment Option C: Bajagua LLC, Proposal – Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Discharge Option I: Treated Effluent Discharged in United States via SBOO
  - Discharge Option II: Treated Effluent Discharged in Mexico at Punta Bandera
- **Alternative 5**: Secondary Treatment in the United States at SBIWTP
  - Option 5A: Completely Mixed Aeration (CMA) Ponds at SBIWTP
  - Options 5B-1 and 5B-2: Activated Sludge Secondary Treatment at SBIWTP
- **Alternative 6**: Secondary Treatment in the U. S. and in Mexico
- **Alternative 7**: SBIWTP Closure/Shutdown

The three treatment alternatives considered but eliminated from further consideration are:

- Operate SBIWTP with Treated Flows Returned to Mexico for Discharge to Pacific Ocean at a new discharge point south of Punta Bandera.
- Operate SBIWTP With Treated Flows Sent to Mexico and the South Bay Water Reclamation Plant.
- Alternative Treatment Processes and Technologies at SBIWTP (biologically aerated filters, pretreatment, aerated lagoons, constructed wetlands, soil aquifer treatment systems, infiltration basins and surfactant modified zeolite fields).

These alternatives were rejected because they either do not meet the objectives of the action, are inappropriate for the effluent from Mexico, or are no longer considered reasonable or feasible. Many of the treatment technologies considered do not take into consideration the specific characteristics of effluent coming from Mexico which exhibits acute toxicity and other toxic substances. The USIBWC has decided to consider implementation of mechanical treatment processes over natural treatment process which requires more time and larger land area. Natural processes can typically lead to more problems with vectors and odor. It is also important to keep in mind that, in accordance with all IBWC Minutes, Mexico considers their wastewater and sludge as their own commodity that should be returned to Mexico for beneficial uses and/or reuse (i.e., sludge).

Public Law 106-457

On November 6, 2000, Congress enacted Public Law 106-457 (*Estuaries and Clean Waters Act of 2000*). Title VIII of this law (*Tijuana River Valley Estuary and Beach Cleanup*) authorizes the United States to comprehensively address the treatment of sewage from the Tijuana River area. Subject to negotiating a new minute or amending Minute 283, the USIBWC is authorized to provide for a public-private wastewater treatment facility in Mexico to treat not more than 75 mgd of wastewater generated in Mexico. It also authorized the EPA to develop a comprehensive plan to analyze the long-term secondary treatment needs of the San Diego–Tijuana border region, analyze upgrades in the sewage collection system serving the Tijuana area, and identify recommendations for providing additional sewage treatment capacity for future flows.

Specifically, Public Law 106-457 authorizes the USIBWC to:

- Provide for a wastewater treatment facility in Mexico for the secondary treatment of no more than 50 mgd of effluent from the SBIWTP if such treatment is not provided at a facility in the United States (i.e., 25 mgd of advanced primary treated effluent from the SBIWTP and 25 mgd of raw sewage emanating from the Tijuana River area in Mexico).
- Provide additional capacity for advanced primary and secondary treatment of up to 25 mgd of additional sewage generated in Mexico, in addition to the treatment capacity for the advanced primary effluent from the SBIWTP, if the results of the comprehensive plan recommend providing such capacity in Mexico.

The USIBWC had not previously considered secondary treatment in Mexico as a feasible option to comply with the CWA at the SBIWTP. The 1999 Final SEIS did not consider secondary treatment in Mexico as a viable alternative because the United States did not have legal authority to construct a facility in Mexico. In addition, the Mexican Government did not endorse the construction of such facilities at that time. In addition, it was considered infeasible was because Minute 283 and Section 510 of the Water Quality Act of 1987 required secondary treatment to be provided in the United States.

However, on February 20, 2004, the United States and Mexican sections of the IBWC signed Minute 311, which provides a framework for funding construction, operation, and maintenance of a 59 mgd secondary wastewater treatment plant in Mexico, if secondary treatment of 25 mgd of advanced primary effluent of the SBIWTP is not provided in the United States. The Minute was formally approved by the United States Government on February 23, 2004, and by the Mexican Government on March 4, 2004, thereby entering into force as a legally binding agreement between the two countries. Implementing a secondary treatment facility in Mexico consistent with PL 106-457 would provide the secondary treatment originally to be provided at the SBIWTP in conformance with Minute 283.

On November 16, 2004, Congress passed legislation to amend Public Law 106-457. The legislation, initiated as House Rule (H.R.) 4794, was signed by the President on November 30, 2004. This legislation amends the Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000 to extend the authorization of appropriations and for other purposes.

POTENTIAL EFFECTS OF THE ALTERNATIVES

The environmental impacts of each of the treatment alternatives and discharge options evaluated in this Draft SEIS have been summarized in Table ES-1.

Table ES-1. Summary of Potentially Significant Impacts for Alternatives

Potentially Significant Impact	Applicable Alternative
Water Resources	
Protection of water quality in the Tijuana River and Estuary by diversion of dry-weather flows at the international boundary	Alternative 1 Option A
Water quality of storm flows crossing the international border into the Tijuana River and Estuary	Alternative 1 Option A
Water quality objectives for protection of marine aquatic life in the South Bay Ocean Outfall area of influence	Alternative 1 Options A and B
Effects of Punta Bandera coastal discharge on total coliform bacteria concentrations at the international border shoreline	Alternatives 1 Option B, 2, 3, 4 (Options A, B and C with Discharge Option II), 5 (all options) and 7
Effects of Punta Bandera discharge on water quality objectives of the California Ocean Plan for protection of marine aquatic life	Alternatives 1 Option B, 2, 3, 4 (Options A, B and C with Discharge Option II), 5 (all options) and 7
Biological Resources	
Terrestrial Resources. Loss of up to 30 acres of non-native grassland (sensitive habitat)	Alternatives 5 (all options) and 6
Impact to non-native grassland from construction of pipelines connecting SBIWTP and the Bajagua Project treatment plant site	Alternatives 4 Options A and C with Discharge Options I and II
Disturbance of least Bell's vireo from construction traffic noise along transportation routes to the SBIWTP site	Alternatives 4 Options A and C with Discharge Options I and II
Impacts to Southwestern willow flycatcher and least Bell's vireo from construction of eastern pipeline corridor in Mexico	Alternatives 4 Options A, B and C with Discharge Options I and II
Loss of up to 33-acres of annual grassland at Bajagua Project treatment plant site	Alternatives 4 Option C with Discharge Options I and II
Estuarine Resources. Degradation of estuarine habitat at the Tijuana River	Alternative 1 Option A
Marine Resources. Degradation of benthic communities from increased discharge at Punta Bandera resulting in reduction of higher trophic level resources for protected species	Alternatives 1 (both options), 2, 3, 4 (all options with Discharge Option II), 5 (both options) and 7

Table ES-1. Summary of Potentially Significant Impacts for Alternatives (Cont'd)

Potentially Significant Impact	Applicable Alternative
Cultural Resources	
Potential loss of archaeological material as a result on construction	Alternatives 3, 4 (Options A and C with Discharge Options I and II), 5 (all options) and 6
Potential loss of paleontological material as a result of construction	Alternatives 3, 4 (all options), 5 (all options) and 6
Land Use	
Adverse effect on land uses along the Tijuana River and at Imperial Beach as a result of discharge of raw sewage into the Tijuana River	Alternative 1 Option A
Adverse effect on Imperial Beach coastal uses from increased discharge of treated and untreated effluent at Punta Bandera	Alternatives 1 (all options), 2, 3, 4 (Options A, B and C with Discharge Option II), 5 (all options) and 7
Socioeconomics	
Economic effect on coastal-dependent businesses at Imperial Beach and along the Tijuana River	Alternative 1 Option A
Public Health and Safety	
Potential health hazard from contamination and vectors associated with discharge into the Tijuana River	Alternative 1 Option A
Potential health hazard from recreational use of seawater contaminated by increased discharge at Punta Bandera or the South Bay Ocean Outfall	Alternatives 1 (Option B), 2, 3, 4 (Options A, B and C with Discharge Option II), 5 (all options) and 7
Environmental Justice	
Adverse effect on minority and low-income population from discharge of untreated sewage into the Tijuana River (2023)	Alternative 1 Option A
Adverse effect on minority and low-income population from temporary beach closures due to high bacterial concentrations in seawater (July/August 2009 – 2023)	Alternatives 1 (Option B), 2, 3, 4 (Options A, B and C with Discharge Option II), 5 (all options) and 7

IDENTIFICATION OF PREFERRED ALTERNATIVE

The USIBWC has identified Alternative 4, Treatment Option C, as the preferred alternative in this Draft SEIS. This alternative would enable the USIBWC to meet the purpose and need for achieving long-term compliance with the CWA in accordance with Public Law 106-457. This alternative was selected for the following reasons:

- Secondary Treatment: Secondary treatment is the environmentally preferred alternative. The Bajagua LLC proposal is one of the secondary treatment alternatives that is designed to meet secondary treatment standards and California Ocean Plan requirements. Preliminary designs and analyses have been prepared.

- The Bajagua LLC proposal is consistent with Public Law 106-457, the *Estuaries and Clean Waters Act of 2000*, as amended. This alternative would also be consistent with IBWC Minute 311 and the Potable Water and Wastewater Master

Plan for Tijuana and Playas de Rosarito, prepared by the State Commission of Public Services Tijuana (CESPT) and the EPA.

- In 1999, USIBWC issued a ROD to build facilities adjacent to the SBIWTP to achieve compliance with secondary treatment requirements. USIBWC and USEPA sought Congressional funding to implement this decision but Congress to date has not provided funding for construction of such secondary treatment facilities in the United States.

- Meets Long-Term Needs of the San Diego/Tijuana Region: This alternative provides an opportunity for Mexico to expand its treatment infrastructure/capacity and reduce or eliminate raw sewage flows into the United States. Alternative 4 Option C promotes potential re-use activities in Mexico thus reducing its dependence on Lower Colorado River water supply and other water sources. This alternative promotes, after 20 years, the enhancement of CESPT's institutional capacity because the facility will be paid in full enabling CESPT to allocate resources to other infrastructure needs. Given projected increased flows in Tijuana, this alternative would provide the best long-term approach to meeting the wastewater treatment needs for the region.

The USIBWC will consider comments on the Draft SEIS concerning the preferred and other alternatives, and will address these comments in the Final SEIS.

CHAPTER 1 – PURPOSE AND NEED

This chapter contains an introduction, the purpose and need for the action, a background and historical setting of the project, the project setting and facilities description, and a summary of the organization of the document.

1.1 INTRODUCTION

mgd	lps
5	219
6	263
9	394
12	526
15	657
25	1,095
29	1,270
31	1,358
34	1,489
36	1,577
40	1,752
50	2,190
59	2,584
65	2,847
84	3,679
100	4,380
174	7,621
333	14,585

Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended, the United States Section, International Boundary and Water Commission (USIBWC) proposes to analyze and evaluate the impacts of sewage treatment alternatives for the South Bay International Wastewater Treatment Plant (SBIWTP). The SBIWTP, an international wastewater treatment plant located in San Diego County at the United States/Mexico border, plays a critical role in protecting public health and the environment of the south San Diego region. The SBIWTP treats an average of 25 million gallons per day (mgd) of raw sewage originating from Tijuana and then discharges the treated effluent approximately 3.5 miles out into the Pacific Ocean through the South Bay Ocean Outfall (SBOO). The SBIWTP and its system of canyon collectors prevent millions of gallons of dry weather flows of raw sewage from flowing daily from Mexico into the United States and polluting the Tijuana River, the Tijuana River Valley and Estuary, and south San Diego beaches.

Metric Conversion

1 mgd = 43.8 liters per second (lps)
25 mgd = 1,095 lps

1.2 PURPOSE AND NEED

This proposal for agency action considers existing and new alternatives that would enable the USIBWC to bring the SBIWTP into compliance with the Clean Water Act (CWA) and the requirements contained in its National Pollutant Discharge Elimination System (NPDES) permit and to evaluate new information on the current discharges of advanced primary effluent from the SBIWTP through the SBOO, as well as interim actions that would allow continued operations of the SBIWTP until the SBIWTP achieves CWA compliance. The original purpose and need for this proposal was identified in the 1994 Final Environmental Impact Statement (EIS) and Record of Decision (ROD), validated in the 1999 Final Supplemental Environmental Impact Statement (SEIS) and ROD, and remains valid for this Draft Supplemental EIS. Since the 1994 Final EIS and ROD were completed, additional information has become available and new circumstances have arisen that require additional consideration of long-term treatment options for the SBIWTP.

South Bay International Wastewater Treatment Plant

The purpose of this action is to provide wastewater management facilities that safeguard the public health, environment, public beaches, water quality, and economy of San Diego, California and Tijuana, Baja California, in compliance with the Clean Water Act, including interim actions that would allow continued operations of the SBIWTP until the SBIWTP achieves Clean Water Act compliance. This Draft SEIS evaluates new information on the current discharges of advanced primary effluent from the SBIWTP through the SBOO. This Draft SEIS will also consider impacts in the United States of steps to be undertaken in Mexico to minimize dry weather flow of untreated sewage from the municipality of Tijuana into the United States. This action is needed because the SBIWTP currently operates and discharges only at the advanced primary treatment level and cannot meet all the requirements of the CWA and its NPDES Permit, including secondary treatment requirements. The No Action Alternative and six action alternatives are currently being evaluated in this Draft SEIS. The alternatives were developed to enable the USIBWC to meet the purpose and need of this action and to guide USIBWC decision-making.

1.3 BACKGROUND

Primary Treatment	Physical Process To Remove Organic and Inorganic Solids
Secondary Treatment	Biological Process to Remove Fine Suspended, Dispersed and Dissolved Solids
Tertiary Treatment	Removal of Nutrients • Nitrogen • Phosphorus Reclamation • Filtration • Disinfection
Advanced Treatment	Use of Chemicals to Enhance Treatment

In 1999, the USIBWC completed a SEIS which examined long-term treatment options for complying with the CWA by achieving secondary treatment at the SBIWTP. Since completion of that SEIS, additional information has become available and new circumstances have arisen that require additional consideration for achieving CWA compliance. Namely:

- In 1999, the USIBWC and United States Environmental Protection Agency (EPA) issued a Record of Decision (ROD) to build a completely-mixed aerated ponds system adjacent to the SBIWTP to achieve secondary treatment requirements. Although the USIBWC and EPA sought Congressional funding to implement this decision, to date Congress has not funded the construction of secondary treatment facilities. Also in 1999, the Surfrider Foundation filed a lawsuit (Case No. 99-CV-2441BTM[JFS]) against USIBWC alleging violations of the SBIWTP's NPDES permit. This lawsuit was resolved through a consent decree that requires the USIBWC to perform additional studies and monitoring of discharges from the SBIWTP.

- In November 2000, Congress passed the Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000. Public Law 106-457 authorizes the secondary treatment of effluent from the SBIWTP in Mexico if secondary treatment is not provided in the United States. Public Law 106-457 requests that the United States Secretary of State negotiate a new agreement with Mexico to provide for secondary treatment of that effluent, as well as treatment for additional sewage flows up to a maximum capacity of 75 mgd, under a public-private partnership arrangement.

South Bay International Wastewater Treatment Plant

Advanced Primary Treatment Plant

- Uses Chemicals to Aid Coagulation and Settling of Small Particles
- Disinfection and Odor Control is also provided

- In February 2001, the California Regional Water Quality Control Board, San Diego Region (Regional Board), filed a lawsuit (Case No. 01-CV-0270BTM [JFS]) in federal district court in San Diego against the USIBWC alleging violations of the federal CWA and state Porter-Cologne Act based on the SBIWTP's inability to meet all the limitations of its NPDES permit. In December 2003, the Court entered summary judgment against the USIBWC finding that SBIWTP discharges exceed, and will continue to exceed, the effluent limits and treatment standards set forth in the NPDES permit in the absence of secondary treatment, and that the discharges constitute violations of the federal CWA and California Porter-Cologne Act. The Regional Board sought an injunction requiring the USIBWC to comply with all the requirements of its NPDES permit. On December 6, 2004, the United States District Court issued an order entering final judgment in favor of the Regional Board and setting a schedule for USIBWC to come into compliance with the effluent standards and limitations of its NDPES permit. The order is based upon stipulations submitted to the Court by the parties and provides that the USIBWC shall achieve compliance not later than September 30, 2008.
- In March 2003, the Comision Estatal de Servicios Publicos Tijuana (CESPT) and the EPA issued a comprehensive master plan addressing sanitation problems in the San Diego-Tijuana border region as called for in Public Law 106-457. That plan is titled the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (Master Plan). The Master Plan identifies construction of a 59-mgd secondary treatment plant which would have the capacity to treat both the SBIWTP's effluent and additional sewage flows generated by the region, and projects that a 59-mgd facility would be adequate to meet the region's needs through 2023.
- In February 2004, consistent with Public Law 106-457, an agreement, IBWC Minute 311, was signed by the United States and Mexican Sections of the International Boundary and Water Commission (IBWC). IBWC Minute 311 provides a framework for the design, construction, operation, and maintenance of secondary treatment facilities in Mexico for sewage originating in Tijuana, Mexico, including sewage currently treated to the advanced primary level at the SBIWTP, if secondary treatment is not provided in the United States.

1.4 ALTERNATIVES

This Draft SEIS is being prepared to enable the USIBWC to identify the environmental effects of alternatives being considered to bring the SBIWTP into compliance with the CWA. The USIBWC considered a range of reasonable alternative treatment and discharge options to comply with the CWA. Figure 1.4-1 shows the seven alternatives identified.

This Draft SEIS evaluates the following seven alternatives:

- Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)
  - Option A: With No Future Improvements to Mexico's Existing Conveyance Facilities
  - Option B: With Future Improvements to Mexico's Existing Conveyance Facilities
- Alternative 2: Operate SBIWTP as Advanced Primary Facility With Treated Flows Conveyed to Mexico for Discharge

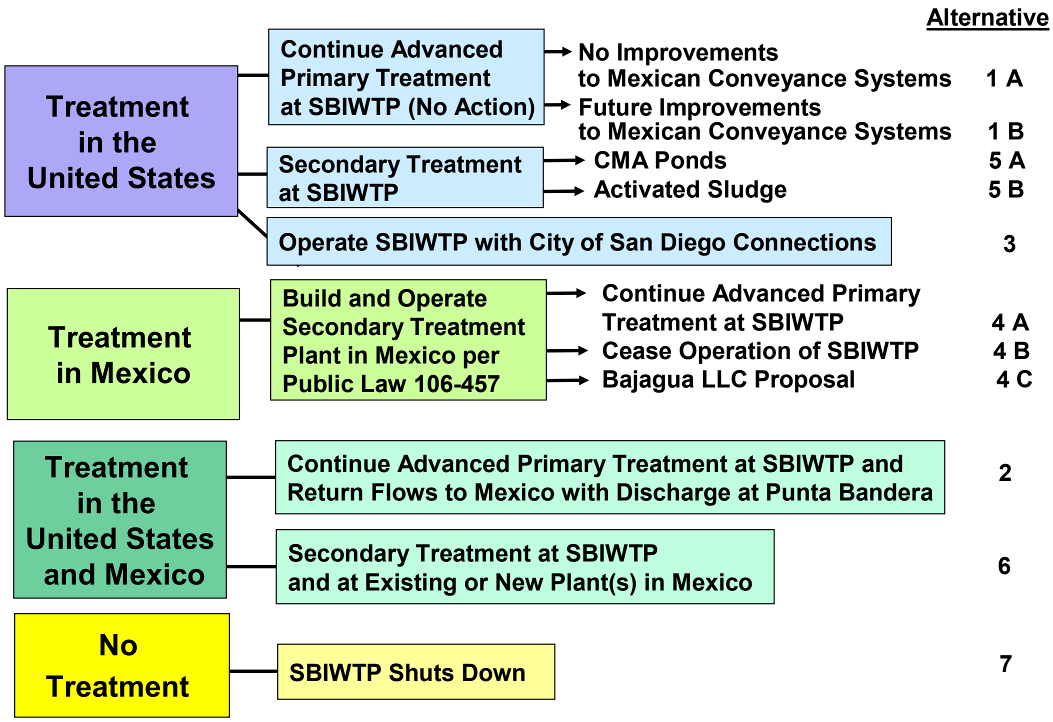


Figure 1.4-1. Options to Achieve Compliance with the Clean Water Act

- Alternative 3 – Operate SBIWTP with City of San Diego Connections (Interim Alternative only)
- Alternative 4 – Public Law 106–457, Secondary Treatment Facility in Mexico
  - Treatment Option A: Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Treatment Option B: Cease Operation of SBIWTP, Secondary Treatment in Mexico
  - Treatment Option C: Bajagua LLC, Proposal – Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Discharge Option I: Treated Effluent Discharged in United States via SBOO
  - Discharge Option II: Treated Effluent Discharged in Mexico at Punta Bandera
- Alternative 5: Secondary Treatment in the United States at SBIWTP
  - Option A: Completely Mixed Aeration (CMA) Ponds at SBIWTP
  - Options B-1 and B-2: Activated Sludge Secondary Treatment at SBIWTP
- Alternative 6: Secondary Treatment in the United States and in Mexico
- Alternative 7: SBIWTP Closure/Shutdown

The USIBWC has identified Alternative 4, Treatment Option C, as the preferred alternative in this Draft SEIS. The USIBWC will consider comments on the Draft SEIS to identify the preferred and other alternative in the Final SEIS.

Treatment alternatives considered but eliminated from further consideration are:

- Operate SBIWTP with Treated Flows Returned to Mexico for Discharge to Pacific Ocean at a new discharge point south of Punta Bandera.
- Operate SBIWTP With Treated Flows Sent to Mexico and the South Bay Water Reclamation Plant.
- Alternative Treatment Processes and Technologies at the headworks of the SBIWTP (biologically aerated filters, pretreatment, aerated lagoons, constructed wetlands, soil aquifer treatment systems, infiltration basins and surfactant modified zeolite fields).

These alternatives were rejected because they either do not meet the objectives of the action, are inappropriate for treatment of effluent from Mexico, or are no longer considered reasonable or feasible.

1.5 PUBLIC SCOPING PROCESS

The USIBWC published a Notice of Intent to Prepare a Draft SEIS in the October 22, 2003, issue of the Federal Register. A 60-day public scoping period was established to allow public comment on the Notice of Intent. The USIBWC held a public scoping meeting on November 12, 2003, to present project information and obtain public and agency comments on the alternative treatment options to be evaluated in the Draft SEIS. The USIBWC received comments about treatment alternatives, transboundary effects, alternative technologies, costs, toxic effects, and odors in written letters and as comments at the public scoping meeting (refer to Table 7.1-3). Figure 1.5-1 shows the primary and specific environmental issues raised during the public scoping process.

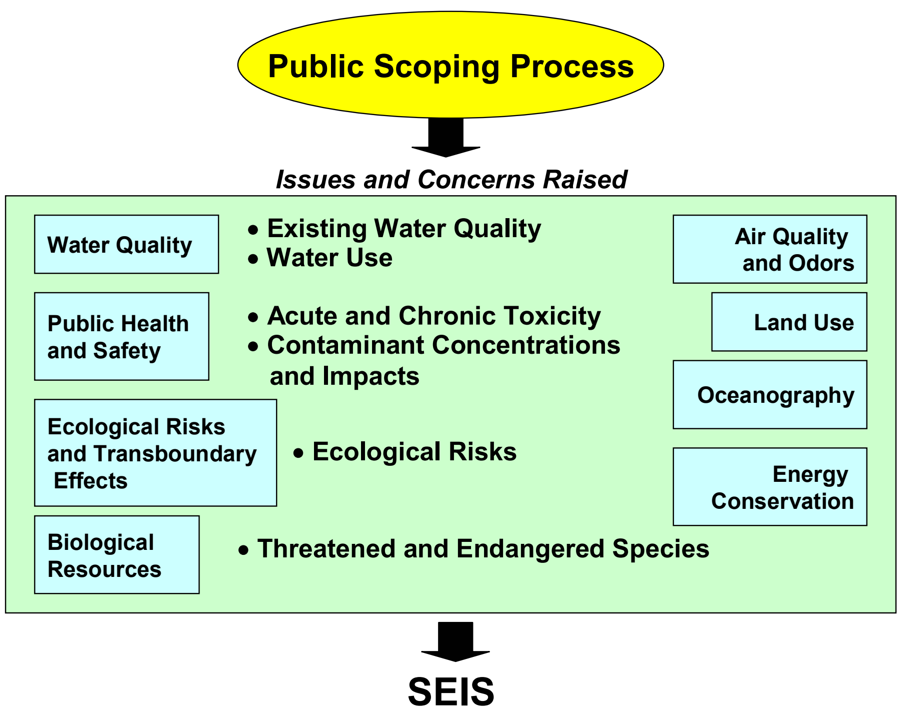


Figure 1.5-1. Environmental Comments Received During the Public Scoping Process

The environmental issues raised during the public scoping process were evaluated in the Draft SEIS. Comments on the treatment alternatives and environmental effects of the action were considered by the USIBWC and have influenced the development and evaluation of treatment alternatives.

1.6 HISTORICAL SETTING

Since the 1930s, raw sewage flowing into the United States from Mexico has posed a serious threat to public health and the environment in the South Bay communities of San Diego. Before the SBIWTP was constructed, uncontrolled sewage flows entered the United States at various locations along the United States/Mexico border in the San Diego area. The USIBWC's efforts to control these fugitive flows were defensive, involving capturing transboundary sewage and returning it to Mexico for transport in Mexico's collection system, or sending to the City of San Diego's Point Loma Wastewater Treatment Plant by use of the Emergency Connection, a 30-inch gravity sewer main connecting the Tijuana sewer system to the City of San Diego sewer system. The defensive measures for collection and pump back to Mexico, constructed in the mid-1980s, were removed from service about 10 years after construction of the SBIWTP and associated canyon collector systems. The USIBWC has undertaken a series of initiatives in the form of international agreements and technical studies to address this problem over the past 20 years. Figure 1.6-1 is a timeline of these activities.

1.6.1 History of Contamination

Wastewater from Tijuana, Mexico, has historically flowed into the United States via the Tijuana River or through north-draining canyons and gullies. Untreated wastewater is also discharged by Mexico to near-shore ocean waters in Mexico, 5.6 miles (9 km) south of the international border.

Wastewater contamination associated with these flow patterns has been identified in numerous emergency declarations by local, state, and federal legislative bodies and commissions. To address this international problem, the United States and Mexico entered into binational agreements (referred to as Minutes) to construct and operate new facilities in both countries to collect, treat, and dispose of wastewater. These Minutes are summarized below and are included in their entirety in Appendix B. Over the past seven decades, local agencies and governments in Mexico and the United States have undertaken various improvements to the collection, treatment, or disposal facilities in Mexico and the United States to alleviate wastewater flow coming into the United States (see Subsections 1.7.4 and 1.7.5 for a detailed description of the improvements).

Failures and breakdowns of the Mexican system have produced overland flow of sewage into canyons and gullies that empty into the Tijuana River Estuary. Sewage flows have caused beaches to be quarantined along the south San Diego coast and adversely impacted the Tijuana River estuary, a National Estuarine Research Reserve.

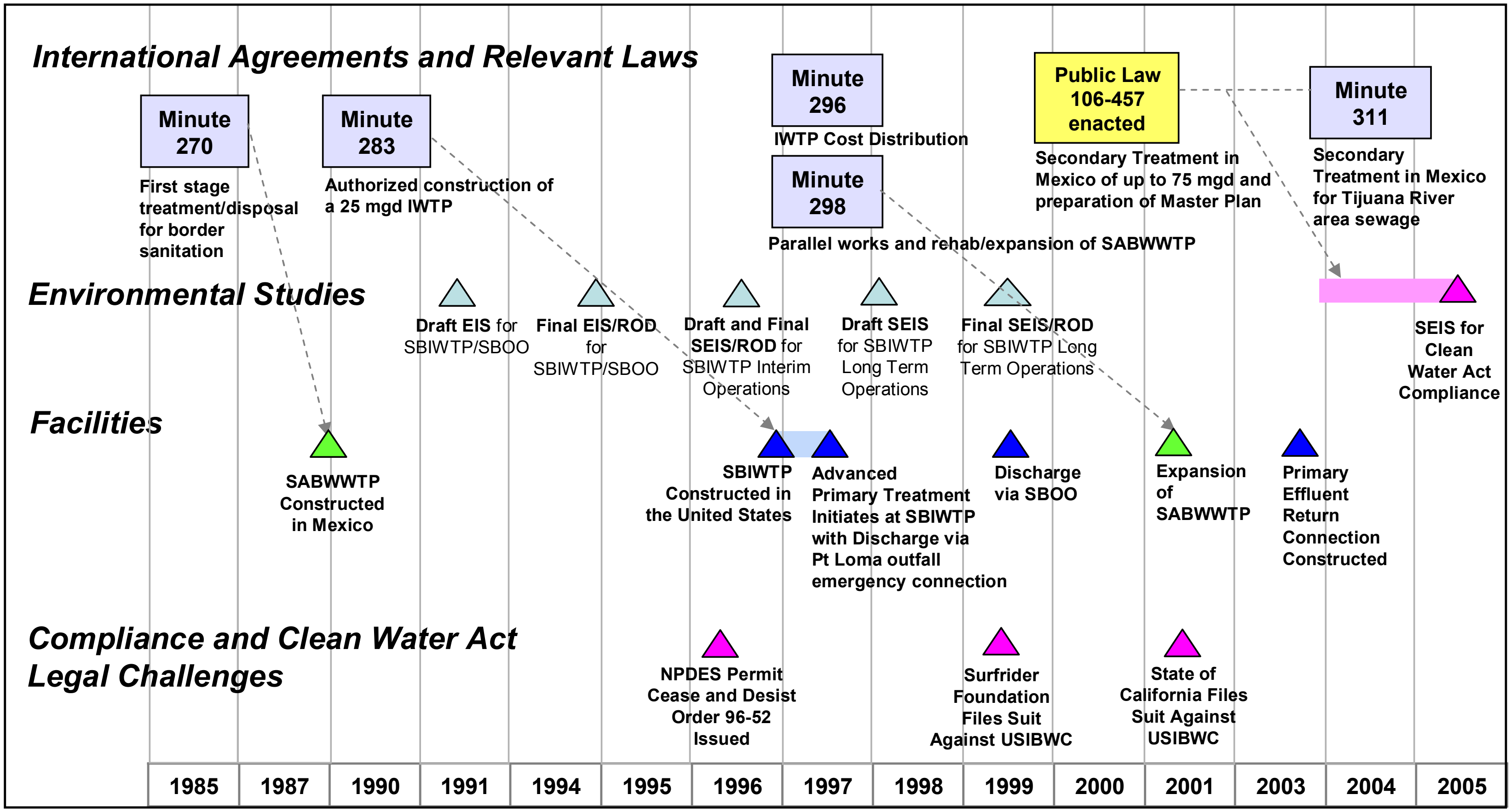


Figure 1.6-1. Timeline of Elements Affecting the Project

1.6.2 History of the SBIWTP

To address uncontrolled sewage flows from Mexico, Congress passed Section 510(b)(2) of the Water Quality Act of 1987 (Section 510) which directed the EPA to give financial assistance to the USIBWC and other agencies “for treatment works in the City of San Diego California to provide primary or more advanced treatment” of Mexican waste originating from Tijuana. In 1990, the United States and Mexico entered into an international agreement, IBWC Minute 283 (Conceptual Plan for the International Solution to the Border Sanitation Problem in San Diego, California/Tijuana, Baja California), which provided for the construction, operation, and maintenance of an international secondary treatment plant in San Diego with joint financing by the United States and Mexican governments.

From 1991 to 1994, Congress appropriated $239.4 million to the EPA for this project. The EPA distributed these funds to the USIBWC to plan, design, and construct the SBIWTP, to the City of San Diego to construct the SBOO, and to the United States Army Corps of Engineers to provide planning and environmental review assistance. To date, about $233 million of this amount has been expended by these agencies for all necessary planning, design, and construction for the SBIWTP, the SBOO, and related facilities in San Diego. Mexico has begun paying its commitment of approximately $16.8 million in capital costs. These costs are being paid over a 10-year period that began in 1997.

In 1991, in the original Draft EIS for the SBIWTP project, the EPA and USIBWC proposed constructing a secondary treatment facility in San Diego to achieve secondary treatment using an activated sludge technology. By the time of issuance of the 1994 Final EIS and May 1994 ROD,[1] however, funding was inadequate to complete construction of a full secondary treatment facility. To address public health and environmental concerns and to provide some treatment capability as soon as possible, the EPA and USIBWC decided to construct the SBIWTP in two stages: building first an advanced primary wastewater facility, followed by constructing the secondary component when funds were secured.

In 1996, the EPA and USIBWC, in consultation with state and local agencies, proposed to operate the plant at the advanced primary level and to discharge the treated effluent through the SBOO upon its completion. In 1997, after the appropriate environmental documentation was completed, the EPA and the USIBWC went forward with this proposal.[2] The decision to operate the SBIWTP as an advanced primary facility was made with the knowledge that there would probably be exceedances of the NPDES permit and the California Ocean Plan (refer to the March 1997 ROD and the December 1998 ROD).

This EPA-USIBWC decision to operate the SBIWTP as an advanced primary facility before secondary treatment facilities were completed was made to achieve some treatment of sewage flows from Mexico that were entering the United States and polluting the Tijuana River, the Tijuana Estuary, and coastal areas from the international border northward to Coronado (refer to page 5 of the March 1997 ROD). Without this treatment, dry weather untreated Mexican sewage would continue to flow into the United States, causing risks to human health and safety from

[1] These previous NEPA documents are incorporated by reference in accordance with 40 CFR 1502.21.

[2] Refer to the March 1997 ROD, as amended by the December 1998 ROD. These documents are available at http://www.epa.gov/region09/water/iwtp/

waterborne disease and disease-bearing vectors, impacts to a national estuarine reserve and habitat for endangered species, loss of recreational use of coastal areas and state and local parks, and substantial negative effects on the local economy (refer to pages 2 and 3 of the May 1994 ROD, page 5 of the March 1997 ROD, and page 3 of the December 1998 ROD).

Following settlement of a 1994 lawsuit involving NEPA compliance for the plant, the EPA and USIBWC reexamined the alternatives available to complete the secondary treatment component of the facility. In 1998, an additional lawsuit involving NEPA compliance for the plant's SBOO was filed; that lawsuit was dismissed. In 1999, the EPA and USIBWC decided to build a completely mixed aerated pond system at the former Hofer site adjacent to the SBIWTP advanced primary treatment facilities (refer to the December 1999 ROD). Although the EPA and USIBWC sought congressional approval to raise the funding limits so the agencies could implement this decision, Congress declined to fund construction of the secondary treatment component in the United States.

The SBIWTP now plays a critical role in wastewater treatment in the San Diego/Tijuana border region. The SBIWTP is connected to the Tijuana wastewater collection and treatment system and, therefore, significantly alleviates the burden on that system. The SBIWTP also addresses the problem of sewage flows in the United States in two ways: (1) canyon collectors in Smuggler's Gulch, Goats Canyon, Canyon del Sol, Stewart's Drain, and Silva's Drain capture dry weather raw sewage flows that would otherwise come into the United States through these canyons and gullies and sends the flows directly to the SBIWTP for treatment and discharge through the SBOO; and, (2) a river diversion structure situated on the Mexican border diverts dry weather sewage flows that would otherwise come into the United States through the Tijuana River and pumps those flows into the Tijuana wastewater system, where the sewage is sent to the SBIWTP for treatment and discharged on the United States side of the border through the SBOO, or pumped on the Mexican side of the border to the San Antonio de los Buenos Wastewater Treatment Plant (SABWWTP), Tijuana's major wastewater treatment plant, for treatment or bypass and discharge into the Pacific Ocean at Punta Bandera about 5.6 miles south of the border. A limited amount of wet weather flow is also captured by collectors that are wet weather operable under light rainfall and runoff conditions.

Even with operation of the SBIWTP, the existing Tijuana wastewater treatment system has insufficient capacity to treat all the sewage generated in Tijuana. Consequently, Tijuana discharges approximately 6 mgd of sewage directly into the Pacific Ocean untreated about 5.6 miles south of the United States border. In addition, the Tijuana collection system infrastructure has been in disrepair for many years, routinely resulting in sewage overflows and spills in Tijuana, including spills into the Tijuana River that can enter the United States.

The USIBWC expends about $9.4 million annually to operate and maintain the electrical power, influent, effluent, sludge, ocean and surf monitoring, major capital improvements and equipment, and contract administration. Mexico shares in these operational costs and reimburses the USIBWC for about 20 percent of the costs annually, pursuant to IBWC Minute 296 (Distribution of Construction, Operation and Maintenance Costs for the International Wastewater Treatment Plant Constructed under the Agreements in Commission Minute 283 for the Solution of the Border Sanitation Problem at San Diego, California–Tijuana, Baja California).

1.6.3 International Agreements Relating to the Treatment of Tijuana Sewage

The United States and Mexico have entered into several international agreements to address the sewage flow problem at the border:

- In 1965, the United States and Mexican sections of the International Boundary and Water Commission signed Minute 222, which provided for the construction, operation, and maintenance of an emergency connection between the City of Tijuana's sewage system and the City of San Diego's South Metro Interceptor Sewer. The emergency connection was originally recommended in the IBWC Joint Report of the Principal Engineers dated November 29, 1965, and was later adopted as a resolution in IBWC Minute 222, titled *Emergency Connection of the City of Tijuana, Baja California to the Metropolitan Sewerage System of the City of San Diego, California*, dated November 30, 1965. This emergency connection has existed since 1966, and can accept up to 13 mgd peak flows from Tijuana for treatment and disposal at the City's Point Loma advanced primary treatment plant and ocean outfall.

- In 1985, the United States and Mexican sections of the IBWC signed Minute 270, which provided for the first stage treatment and disposal of Tijuana wastewaters. In accordance with Minute 270, Mexico constructed a wastewater treatment plant at San Antonio de los Buenos in 1987 to serve the Tijuana municipality.

- In July 1990, the United States and Mexican sections of the IBWC signed Minute 283, which provided for the construction, operation, and maintenance of an international secondary wastewater treatment plant on the United States side of the border that would treat 25 mgd of dry weather sewage flows.

- In May 1997, the United States and Mexican sections of the IBWC signed Minute 296, which provided for the distribution of construction, operation, and maintenance costs for the international wastewater treatment plant constructed under Minute 283 for the solution of the border sanitation problem.

- In December 1997, the United States and Mexican sections of the IBWC signed Minute 298, which offered recommendations for the design-construction of works parallel to the City of Tijuana's wastewater pumping and disposal system as well as the rehabilitation and expansion of the SABWWTP. This included design and construction of the Primary Effluent Return Connection (PERC).

- On February 20, 2004, the United States and Mexican sections of the IBWC signed Minute 311, Recommendations for Secondary Treatment in Mexico of the Sewage Emanating from the Tijuana River Area in Baja California, Mexico. Minute 311 provides a framework for the design, construction, operation, and maintenance of secondary treatment facilities in Mexico for sewage originating in Tijuana, including sewage now treated to the advanced primary level at the SBIWTP, if secondary treatment is not provided in the United States. Consistent with the Public Law, the Minute contemplates that the effluent from the SBIWTP will be treated to the secondary level, if not provided in the United States, at facilities to be constructed, operated, and maintained in Mexico through a public-private partnership. The Minute provides that the secondary treatment level of the facilities to be constructed in Mexico will comply with water quality laws of the United States, the state of California, and Mexico, and that effluent discharge treated by the Mexico facilities and discharged through the SBOO into the Pacific Ocean will comply with water quality laws of the United States and the state of California. Under Minute 311, secondary treatment of the advanced primary effluent from the SBIWTP and treatment of additional Tijuana sewage would be provided as follows, if secondary treatment is not provided in the United States:

- Plant capacity of up to 59 mgd consistent with the Tijuana Master Plan undertaken by the EPA and CESPT to determine future infrastructure needs through the year 2023.
- Any effluent discharged through the SBOO would comply with applicable water quality laws in the United States.
- The project would be implemented through a private-public partnership.
- Commission oversight of selection of contractors and monitoring and evaluation of the performance of the treatment plant as in previous Commission projects.

1.6.4 South Bay International Wastewater Treatment Plant Environmental Review

The original Draft EIS for the SBIWTP project (1991) proposed constructing a secondary treatment facility in San Diego to achieve secondary treatment using an activated sludge technology. Based on a 1994 Final EIS and ROD, the USIBWC and the EPA, acting as lead agencies, approved the construction of the SBIWTP and the SBOO. The SBIWTP is on a 75-acre site in south San Diego County, California, just west of San Ysidro near the intersection of Dairy Mart and Monument roads. Treated effluent is discharged to the Pacific Ocean through the SBOO, a 4.5-mile long piping system completed in January 1999. This outfall extends about 3.5 miles offshore.

The EPA and the USIBWC decided to construct the SBIWTP in phases: by first building advanced primary facilities followed later by secondary treatment facilities. This phased construction would expedite the treatment of up to 25 mgd of untreated sewage from Tijuana that would otherwise have continued to pollute the Tijuana River and Estuary as well as coastal waters in the United States.

Before the SBOO was completed in January 1999, treated effluent was periodically discharged for testing purposes through an emergency connection to the City of San Diego Point Loma Wastewater Treatment Plant. The emergency connection was used daily in the late 1980s and throughout the 1990s, but it has not been used in this manner since the SBIWTP started discharging to the completed SBOO in January 1999. This emergency connection was last used on October 15, 2000 and is available in the event of an emergency.

After the release of the May 1994 Final EIS and ROD and the 1997 decision to operate the SBIWTP as an advanced primary treatment facility, significant additional information became available and new circumstances warranted reconsidering the best means to complete the SBIWTP secondary treatment facilities. The USIBWC and EPA decided to prepare a second SEIS that examined this new information as a settlement to the lawsuit that challenged the 1994 FEIS.

In January 1998, the USIBWC and the EPA issued the Draft Long Term Treatment Options SEIS (Draft SEIS), to re-evaluate the SBIWTP secondary treatment options.

In addition, in October 1998, the agencies also issued a supplement to the 1996 Interim Operation SEIS that addressed impacts of the advanced primary treatment. This supplement disclosed new information about the presence of dioxins and acute toxicity in the advanced primary discharge. This new information was incorporated into the Final Long Term Treatment Options Supplemental Environmental Impact Statement (Final SEIS) released in March 1999.

In the 1999 ROD for the Long Term Treatment Options SEIS, the EPA and the USIBWC selected the CMA pond system at the former Hofer site as the long-term option for secondary treating 25 mgd of wastewater at the SBIWTP. However, Congress did not fund the construction of these secondary treatment facilities and the plant has continued to provide advanced primary treatment[3].

The USIBWC is preparing this Draft SEIS to address proposed treatment alternatives that would bring the SBIWTP into compliance with the CWA ands its NPDES permit limits either: by providing secondary treatment at the SBIWTP; providing secondary treatment in Mexico pursuant to Public Law 106-457; or, by some other means.

Coordination with the EPA, the California Regional Water Quality Control Board, San Diego Region and other government agencies, as required, will ensure compliance with applicable federal and state laws and regulations. Environmental review of this project is being conducted in accordance with the requirements of NEPA, Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500 through 1508), other appropriate federal regulations, and USIBWC procedures for compliance with those regulations.

1.6.5 NPDES Permit

On November 14, 1996 the Regional Board adopted Order No. 96-50, NPDES Permit No. CA0108928 establishing requirements for the discharge of up to 25 mgd of treated wastewater (secondary effluent) from the SBIWTP to the Pacific Ocean through the SBOO. Monitoring and Reporting Program (MRP) No. 96-50 consists of general monitoring and reporting provisions, influent monitoring, effluent monitoring, and receiving environment monitoring (RWQCB, 2003a).

Technical Change Order to MRP No. 96-50 revised the schedule for submitting monitoring reports and modified 1998 schedules for weekly and monthly constituent sampling.

The first addendum to MRP No. 96-50 established advanced primary treatment influent limitations for 12 primary pollutants of concern and identified four other pollutants of concern to be monitored and evaluated in the future for potential risks and health and safety concerns. The second addendum established a compliance schedule for completing the headworks allocation studies for SBIWTP primary and secondary treatment facilities (RWQCB, 2003a).

On April 11, 2001, the USIBWC timely submitted its application for renewal of its NPDES permit to the state. Under the state's NPDES program, a timely submittal automatically extends the existing permit beyond its expiration date until the state issues a permit renewal. At the time of the writing of this Draft SEIS, the state has not acted on that application.

[3] These previous NEPA documents are incorporated by reference in accordance with 40 CFR 1502.21.

1.6.6 Cease and Desist Orders

Concurrent with the issuance of the NPDES permit described above on November 14, 1996, the Regional Board also issued Cease and Desist Order (CDO) 96-52, to establish a time schedule for achieving compliance with the effluent limitations in Order No. 96-50, to establish interim advanced primary treatment effluent limitations, and to establish an interim flow rate prohibition (RWQCB, 2003b). The Regional Board also issued three addendums to CDO 96-52:

- The first addendum, issued May 13, 1998, established a new compliance schedule for completing the Final SEIS, a signed ROD, and construction of the ocean outfall.
- The second addendum, issued October 14, 1998, established a compliance schedule for acute toxicity, required the submission of a toxicity identification evaluation report and schedule for selecting, installing, and implementing secondary treatment, and a ROD.
- The third addendum, issued November 8, 2000, stipulated penalties for failing to complete secondary treatment facilities and comply with effluent limits of the NPDES permit (Order 96-50) by December 31, 2000.

1.6.7 Lawsuit

In February 2001, California's Office of the Attorney General, on behalf of the California Regional Water Quality Control Board, San Diego Region (Regional Board), filed a complaint in United States District Court, Southern District of California, alleging violations of the federal CWA and the California Porter-Cologne Water Quality Control Act. The complaint alleges that effluent discharged by the USIBWC violated the terms of its NPDES permit issued by the Regional Board for failing to treat the effluent to secondary standards and for violating other effluent limitations. The Court found that the USIBWC does not currently meet all the effluent limitations of its NPDES permit and entered a summary judgment against the USIBWC for liability. On December 6, 2004, the United States District Court issued an order entering final judgment in favor of the Regional Board and setting a schedule for USIBWC to come into compliance with the effluent standards and limitations of its NDPES permit. The order is based upon stipulations submitted to the Court by the parties and provides that the USIBWC shall achieve compliance not later than September 30, 2008. The court order setting the compliance schedule is provided in Appendix G.

1.6.8 Public Law 106-457

On November 6, 2000, Congress enacted Public Law 106-457 (*Estuaries and Clean Waters Act of 2000*). Title VIII of this law (*Tijuana River Valley Estuary and Beach Cleanup*) authorizes the United States to comprehensively address the treatment of sewage from the Tijuana River area. Subject to negotiating a new minute or amending Minute 283, the USIBWC was authorized to provide for a public-private wastewater treatment facility in Mexico to treat not more than 75 mgd of wastewater generated in Mexico. This public law also authorized the EPA to develop a comprehensive plan to analyze the long-term secondary treatment needs of the San Diego–Tijuana border region, analyze upgrades in the sewage collection system serving the Tijuana area, and identify recommendations for providing additional sewage treatment capacity for future flows.

Specifically, Public Law 106-457 authorizes the USIBWC to:

- Provide for a wastewater treatment facility in Mexico for the secondary treatment of no more than 50 mgd of effluent from the SBIWTP if such treatment is not provided at a facility in the United States (i.e., 25 mgd of advanced primary treated effluent from the SBIWTP and 25 mgd of raw sewage emanating from the Tijuana River area in Mexico).
- Provide additional capacity for advanced primary and secondary treatment of up to 25 mgd of additional sewage generated in Mexico, in addition to the treatment capacity for the advanced primary effluent from the SBIWTP, if the results of the comprehensive plan recommend providing such capacity in Mexico.

The USIBWC had not previously studied in detail secondary treatment in Mexico as a feasible option to comply with the CWA at the SBIWTP. The 1999 Final SEIS did not consider secondary treatment in Mexico as a viable alternative because the United States did not have legal authority to construct a facility in Mexico. In addition, the Mexican Government did not endorse the construction of such facilities at that time. In addition, it was considered infeasible was because Minute 283 and Section 510 of the Water Quality Act of 1987 required secondary treatment to be provided in the United States.

On February 20, 2004, the United States and Mexican sections of the IBWC signed Minute 311, which provides a framework for funding construction, operation, and maintenance of a 59 mgd secondary wastewater treatment plant in Mexico, if secondary treatment of 25 mgd of advanced primary effluent of the SBIWTP is not provided in the United States. The Minute was formally approved by the United States Government on February 23, 2004, and by the Mexican Government on March 4, 2004, thereby entering into force as a legally binding agreement between the two countries. Implementing a secondary treatment facility in Mexico consistent with Public Law 106-457 would provide the secondary treatment originally to be provided at the SBIWTP in conformance with Minute 283.

On November 16, 2004, Congress passed legislation to amend Public Law 106-457. The legislation, initiated as House Rule (H.R.) 4794, was signed by the President on November 30, 2004. This legislation amends the Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000 to extend the authorization of appropriations and for other purposes.

1.6.9 Status of Mexico's Pretreatment Program

In accordance with Minute 283 (Recommendation 12), the Mexican Government has instituted an industrial pretreatment program in Tijuana to ensure the efficient treatment of Tijuana sewage at the international plant. The binational agreement for the pretreatment program was signed by CESPT, DGE, MxIBWC, USIBWC, the Regional Board and MWWD.

The initial phase of the pretreatment program in Tijuana consisted of training and extensive monitoring. The program objectives are designed to assist in meeting Mexican and United States standards for the effluent and sludge produced at the SBIWTP and to meet Mexican standards at the SABWWTP in Mexico.

The following actions are the main elements of the plan:

1. Share information on pretreatment program policies and procedures between California and Baja, California.
2. Initiate a shadow training program, in which Baja California representatives work directly with City of San Diego bilingual program staff.
3. Provide specific technical training to Mexican wastewater agencies responsible for Tijuana's industrial wastewater, and assist with wastewater sampling and analysis.
4. Identify pollutants of concern and help develop a program in which Baja, California representatives would trace pollutants to their sources.

This program is being implemented by the Mexican authorities represented by CESPT, the DGE, and MxIBWC. In 2002, the program was expanded to include Tecate, Baja California, with Comision Estatal de Servicios Publicos de Tecate (CESPTe) as the lead agency in Mexico. In addition, the IBWC United States and Mexican sections have set up a binational technical committee to investigate opportunities to promote pretreatment activities in Tijuana. The initial focus has concentrated on pretreatment activities for SBIWTP operation, especially strategies to reduce the elevated acute toxicity levels observed at the treatment plant.

The monitoring program in Tijuana was initiated in January 1999, which coincided with the discharge of effluent from the SBIWTP through the SBOO. Monitoring in Tecate began in 2002.

To date, samples analyzed have included hydrogen ion concentration (pH), conductivity, settleable solids, total suspended solids, cyanide, biochemical oxygen demand, chemical oxygen demand, oil and grease, methylene blue active substances, metals, ammonia nitrogen, organochlorine pesticides and polychlorinated biphenyls (PCB), organophosphorus pesticides, volatile and semivolatile organic compounds, and acute toxicity.[4]

1.7 Project Setting and Facilities Description

1.7.1 Location of SBIWTP

The SBIWTP occupies about 75 acres of land in the United States (San Diego County) on the United States/Mexico border. Figure 1.7-1 shows the SBIWTP's location in the region.

The facility is directly north of Tijuana, with an intervening 300-foot buffer of land between the United States/Mexico boundary and the plant. The SBIWTP is situated in the Tijuana River Valley in the Tijuana River watershed. Both the Tijuana River Estuary and the Pacific Ocean lie west about 3.75 miles and downstream of the project site. The closest major United States roadway is Interstate 5 (I-5), which is about 1.5 miles from the SBIWTP off Dairy Mart Road and Monument Road in San Diego.

[4] The USIBWC has posted this data on its website (http://www.ibwc.state.gov).

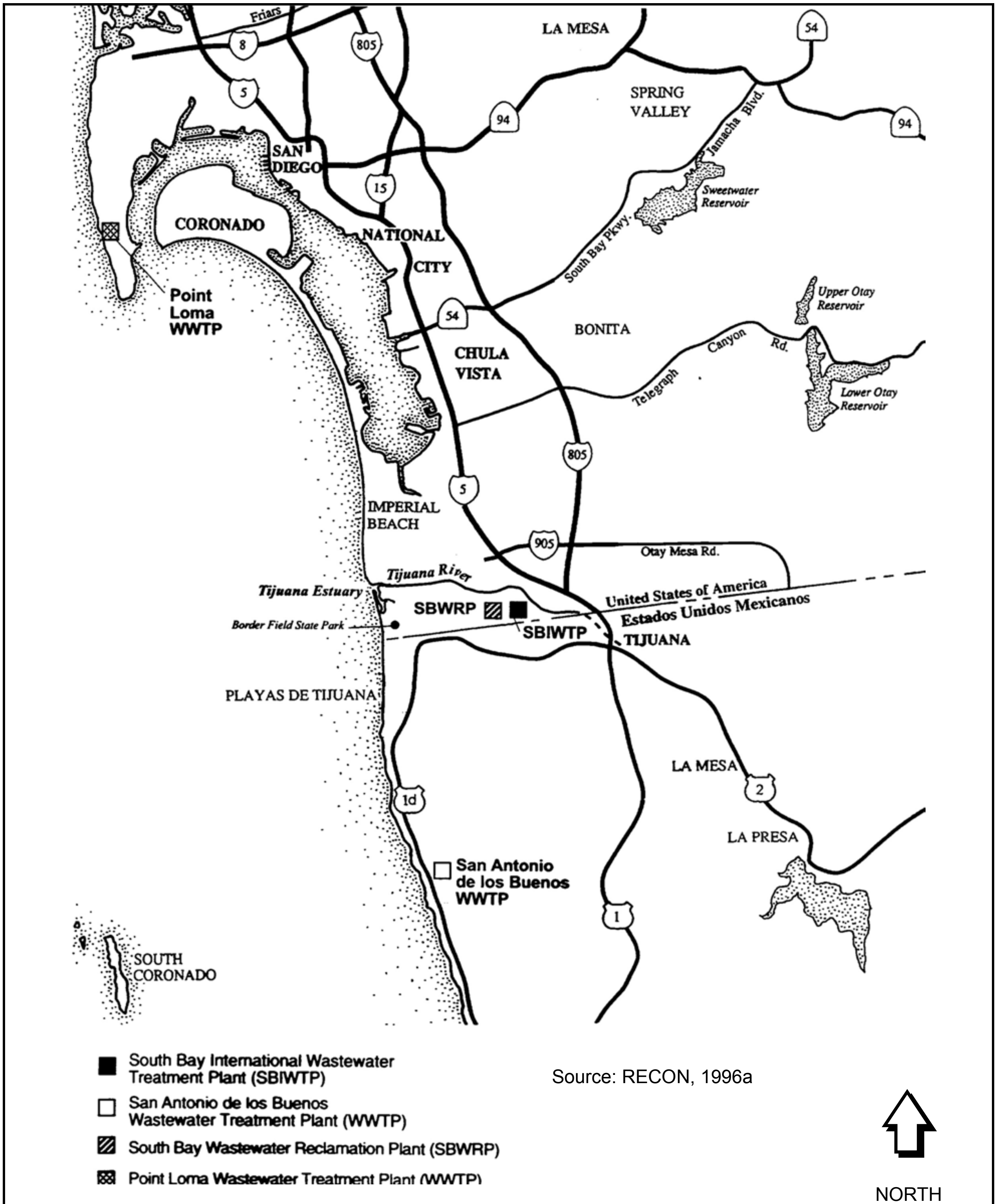


Figure 1.7-1. Wastewater Treatment Facilities in the San Diego and Tijuana Region

1.7.2 United States Setting of the SBIWTP

On the United States side of the border, the area around the SBIWTP is sparsely populated. Most major development is north of the I-5 freeway in San Ysidro and west of the I-5 in Imperial Beach. The areas south and southwest of the I-5, where the SBIWTP and alternative sites are located, are largely undeveloped. A large portion of the surrounding land is publicly owned. The main feature of this area, other than the SBIWTP facilities, is natural open space, including the Tijuana River Valley Regional Open Space Park. Agriculture, ranches, and quarries occupy private lands. To the immediate west of the SBIWTP are lands owned by the City of San Diego; this is the location of the South Bay Water Reclamation Plant (SBWRP).

To the far west is a public coastal recreation area, the Border Field State Park. The Imperial Beach Naval Air Station and the City of Imperial Beach are north of the SBIWTP. The western Tijuana River valley is federally designated as the Tijuana River National Estuarine Research Reserve (TRNERR), which was established by the National Oceanic and Atmospheric Administration (NOAA) to protect one of the few remaining large areas of coastal wetland in southern California. Since 1982, the County of San Diego Parks and Recreation Department and the California Coastal Conservancy have been acquiring land in the estuary (CH2M Hill, 1998a).

1.7.3 Mexico Setting

In contrast to the SBIWTP setting in the United States, Tijuana is a major urban area. The 2003 population was estimated to be 1,270,000. Most of the sewer collection system's service area is in the Tijuana River basin which crosses the city and extends into the United States. The Tijuana River ultimately flows into the Pacific Ocean. Various infrastructure works intercept the water flow in Mexican territory for its eventual delivery to the SABWTP in southern Tijuana (CH2M Hill, 2003). Not all of the occupied housing units have sewer connections. Tijuana has about 2,500 industrial plants, including manufacturing, chemical substances and petroleum, minerals, paper and printing, wood and wood products, textiles, clothing and leather, and food and beverage products.

The municipality of Tecate is about 30 miles east of Tijuana and had a population of about 77,400 in 2000. Tecate had about 132 industrial plants in 2002, and manufacturing is the principal sector of the local economy. Tecate and the Tecate Brewery have wastewater treatment plants that discharge to Tecate Creek and eventually into the Tijuana River watershed.

1.7.4 United States Facilities

The SBIWTP operates as an advanced primary treatment plant. Basic primary treatment involves screening, grit removal, removal of solid matter using gravity, and chlorine disinfection. Advanced primary treatment involves adding chemicals that increase the volume of solid matter removed. Chlorination is conducted from November to April each year. Construction of a proposed dechlorination facility at Goat Canyon has been postponed. The SBIWTP is designed to treat an average of 25 mgd of wastewater from Tijuana with disposal to the ocean via the SBOO. The City of San Diego SBWRP also uses the SBOO to convey excess effluent from the plant that cannot be reused. The outfall eliminated the need to use the emergency pipeline connecting the main collector line in Tijuana and a branch collector line of the San Diego Metropolitan sewage system. This emergency connection, constructed in 1966, was used until January 1999 when the SBOO was completed and intermittently until October 2000.

In 2004, the USIBWC completed construction of the primary effluent return connection (PERC) facilities to connect the SBIWTP to the existing conveyance/pumping facilities in Tijuana (i.e., Pump Station 1/1A Parallel Conveyance System) and to provide an avenue, if needed, to return effluent from the SBIWTP for disposal to the ocean in Mexico. The PERC facilities consist of a 48-inch diameter reinforced concrete pipe extending about 1,200 feet from the United States/Mexico border. It connects to the SBIWTP facilities via a 72-inch by 48-inch T-shaped structure. The connection includes a magnetic flow meter and motor operated control valve housed in a vault, with an isolation structure to facilitate maintenance.

1.7.5 Mexico Facilities


Pump Station 1

Most of the wastewater generated in eastern and central Tijuana is collected via the Tijuana wastewater collection system and conveyed to Pump Station 1/1A. Wastewater from central and western Tijuana is collected at other pump stations at Los Laureles, Mataderos, and Playas de Tijuana. From Pump Station 1/1A, wastewater is directed to the SBIWTP in the United States and is also pumped to the SABWWTP in Mexico via force mains to an open canal and a new parallel conveyance system, which is described below. The wastewater travels south to the SABWWTP for treatment or it bypasses the plant and is discharged directly at the shoreline 5.6 miles south of the international border. The old conveyance system is referred to in this document as the Original Conveyance Channel (OCC). The OCC is sized to handle average flows of 25 mgd and peak flows of 50 mgd. In 2001, average flow through the OCC was 29 mgd (CH2M Hill, 2003).

The SABWWTP began operation in September 1987. The plant was originally designed to treat up to 17 mgd. Renovation and expansion, which began in December 2001 and were completed in early 2004, have increased treatment capacity from 17 to 25 mgd to help meet a current treatment demand of about 43 mgd.


Aeration Lagoon at SABWWTP (Pond 1)

The SABWWTP plant is 4.2 miles south of the international boundary. Wastewater is pumped to aerated facultative lagoons and then to a nonaerated polishing lagoon. Treated effluent is disinfected with chlorine. Effluent from the SABWWTP and wastewater that exceeds SABWWTP capacity is conveyed in a canal to a canyon in the Punta Bandera area, then discharged to the surf.

Lagoons at SABWWTP

A new, 50-mgd parallel pump station and conveyance system was constructed by Mexico to transport wastewater to the SABWWTP. The 16-km conveyance system runs parallel to the original open air OCC. The new pumping and conveyance system was designed to pump an average flow of 25 mgd and peak of 50 mgd, to convey flows from Pump Station 1/1A to the discharge point at SABWWTP in Mexico. This parallel conveyance line (PCL) was designed and originally intended to serve as a backup system to allow for needed repairs to Tijuana's existing conveyance system. However, it is now the primary conveyance system. This line could also be used to return treated effluent from the SBIWTP to Mexico for possible reuse, or to help handle effluent when the facilities designed for discharge to the ocean are not in service for any reason (BECC, 1997).

Renovation and expansion of the SABWWTP and construction of the PCL were certified by the Border Environment Cooperative Commission (BECC) in 1997 and enabled CESPT to apply for construction grants and loans from the North American Development Bank (NADBank).

Ocean Discharge from SABWWTP

The State of Baja California has negotiated a credit program with Japanese institutions for the construction of water and wastewater infrastructure for major cities in the state. The four new wastewater treatment plants, known as Japanese Credit Plants, are planned to commence operation in 2005 in the Tijuana and Playas de Rosarito area. The new plants will treat wastewater by means of activated sludge and will provide about 33 mgd of additional wastewater treatment capacity.

1.8 SCOPE OF THE ENVIRONMENTAL REVIEW

The National Environmental Policy Act (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in the decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental evaluation. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action.

This Draft SEIS assesses the proposed construction and operation of a range of treatment alternatives that would enable the SBIWTP to comply with the Clean Water Act. This Draft SEIS identifies, describes, and evaluates the potential environmental impacts that may result from implementation of treatment alternatives as well as possible cumulative impacts from other actions planned in the area. The Draft SEIS also identifies required environmental permits. The affected environment and environmental consequences may be described in terms of site-specific descriptions or regional overview. Finally, the Draft SEIS identifies mitigation measures to prevent or minimize environmental impacts, if required.

The primary environmental resources associated with the alternative treatment options for the SBIWTP are water resources, geologic resources, biological resources, cultural and paleontological resources, air quality and odors, noise, land use, socioeconomics, public health and safety, environmental justice and energy conservation.

Two environmental resources evaluated in the previous SEIS (CH2M Hill, 1999) that were found not to result in significant impacts have not been re-evaluated in this document. These resource areas are transportation/traffic and visual resources:

- Because the treatment alternatives would not result in any substantial change in employment at the SBIWTP, no increase in consumption of water or power (electricity and natural gas), or generation of wastewater and solid waste would be expected. The treatment alternatives would result in no substantial increase in employee or delivery traffic, therefore, no change to transportation or increase in local traffic would be anticipated.
- There are no scenic or visual resources in the project area. Impacts to visual resources would not be expected as a result of implementation of any of the treatment alternatives.

Neither of these subjects was raised during the public scooping process.

In the current evaluation, transboundary impacts were considered for water resources, biological resources, public health and safety, air quality and odors. These resource areas in Mexico were also considered because indirect or secondary impacts may occur in the United States as a result of direct impacts in Mexico. As part of these analyses, the USIBWC has used the scoping process to identify those actions that may have transboundary environmental effects.

This Draft SEIS evaluates environmental resources in the vicinity of the existing SBIWTP and the immediate area surrounding the facility in the United States. Environmental resources in Mexico are evaluated only when treatment options with construction or operations in Mexico have the potential to impact resources in the United States or would be considered as transboundary effects.

Because there would be no potential for impacts in the United States or significant transboundary effects, the following eight environmental resources were not evaluated in Mexico: geologic resources, cultural and paleontological resources, noise, land use, environmental justice, socioeconomics, and energy consumption.

1.9 ORGANIZATION OF THE DOCUMENT

This Draft SEIS summarizes previous environmental evaluations and incorporates new information that has become available since publication of the 1999 SEIS. Additional information on project alternatives appears in Chapter 2. The affected environment is characterized in Chapter 3, and the environmental impacts (including cumulative impacts) of the alternatives are evaluated in Chapter 4. Environmental commitments, including mitigation requirements, appear in Chapter 5. Chapter 6 summarizes applicable regulations for the United States and Mexico. This chapter also identifies or lists the federal, state, and local permits, licenses, and other agreements that must be obtained to implement the alternatives. Chapters 7 through 11 describe the consultation process (public involvement process), and provides document preparers, references, glossary, and an index.

CHAPTER 2 – ALTERNATIVES CONSIDERED

This chapter is divided into six subchapters: Process Used to Formulate Alternatives; Description of the Alternatives; Alternatives Eliminated from Further Consideration; Related Projects; Comparison of Environmental Impacts of Alternatives; and, Identification of the Preferred Alternative.

2.1 PROCESS USED TO FORMULATE ALTERNATIVES

As Chapter 1 describes, the South Bay International Wastewater Treatment Plant (SBIWTP) provides advanced primary treatment of about 25 mgd of raw sewage from the City of Tijuana, with treated effluent discharged through a land and ocean outfall to territorial waters of the United States. Discharges from the SBIWTP consistently exceed some effluent limitations and standards established in the plant's NPDES permit. The United States Section, International Boundary and Water Commission (USIBWC) is preparing an SEIS to examine alternatives that would bring the SBIWTP into compliance with its NPDES permit limits either by providing secondary treatment in Mexico pursuant to Public Law 106-457, in the United States at the SBIWTP, or by some other means. The SEIS will also examine alternatives for interim actions that would allow continued operation of the SBIWTP until the SBIWTP achieves Clean Water Act (CWA) compliance.

The alternatives for this Draft SEIS were developed in accordance with National Environmental Policy Act (NEPA) requirements to analyze a reasonable range of project alternatives. NEPA requirements for alternatives analysis (40 CFR 1502.14) direct federal agencies to:

- Consider a range of alternatives that could accomplish the lead agency's objectives (i.e., purpose and need) and compare those alternatives to define the issues and provide a clear basis for decision makers and the public to choose among the alternatives.
- Explore rigorously and evaluate objectively a reasonable range of alternatives. If alternatives are eliminated from detailed study, the EIS must briefly discuss the reasons they were eliminated. The range of alternatives is project specific, depending on the nature of the proposal and the facts and circumstances of the project.
- Analyze each alternative on an equal basis.
- Include a "No Action" alternative.

Alternatives under consideration in this Draft SEIS were developed from:

1. A review and evaluation of existing and planned facilities to treat Tijuana's wastewater in the United States and in Mexico.
2. A review of international agreements between the United States and Mexico that document the decisions by the United States and Mexico for collecting, treating, and disposing of wastewater from Tijuana that has historically entered the Tijuana River Valley in the United States (IBWC Minutes 270, 283, 296, 298, and 311).

3. A review of existing legislation, including the federal CWA and the Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000 (Public Law 106-457), and relevant regulations, including the Code of Federal Regulations. A complete list of applicable environmental legislation and regulations appear in Chapter 6 of this Draft SEIS.

4. A review of the SBIWTP's environmental documentation (i.e., past environmental documents prepared pursuant to NEPA) and its NPDES discharge permit issued by the Regional Water Quality Control Board (Regional Board) (NPDES No. CA0108928) and amendments.

5. Issues identified during the public scoping process as a result of the Notice of Intent released October 22, 2003, and comments received at the public scoping meeting held in San Diego, California, on November 12, 2003, or submitted later in writing.

In 2003, the EPA and the Comision Estatal de Servicios Publicos de Tijuana (CESPT) released the *Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito* (Master Plan). The 2003 Master Plan outlines a 20-year program of potable water and wastewater infrastructure development and improvements for the Tijuana-Rosarito area. It also identifies the additional capacity required to treat wastewater flows in the Tijuana River watershed.

To effectively analyze and compare the alternatives, including No Action alternatives, it is necessary to examine existing and future conditions in the Tijuana–San Diego border region, including current and future sewage flows of the City of Tijuana. Wastewater flow estimates for Tijuana were developed by the USIBWC, EPA and Parsons, based on flow data collected by the USIBWC based on effluent from the SBIWTP and in the pipeline from Pump Station 1/1A in February and March 2004. These flows were used to estimate the daily average flows from Tijuana through 2023. Using 2004 measured flows as the base year, the estimates were adjusted based on historical trends to account for the present dry/drought conditions.

Projections for 2009 were derived by applying the Master Plan rates of increase to estimate future flows. The 2023 volumes considered in this Draft SEIS were derived by adding the 2023 flow of 25 mgd that would be treated at the San Antonio de los Buenos Wastewater Treatment Plant (SABWWTP), flow of 25 mgd treated at the SBIWTP and the additional treatment capacity of 34 mgd that the Master Plan determined to be required to treat wastewater flows in the Tijuana River watershed. Table 2.1-1 shows the existing and projected wastewater flows in Tijuana.

Table 2.1-1. Existing and Projected Wastewater Flows in Tijuana (2004, 2009 and 2023

2004	2009	2023
56 mgd	65 mgd	84 mgd
Source: Parsons (September 2004)		

In 2004, average wastewater generation in Tijuana was estimated to be 56 mgd, increasing to 65 mgd by 2009 and to 84 mgd by 2023. Year 2004 represents existing conditions (i.e., the base year) and the first year that the upgraded SABWWTP would operate at an increase average capacity of 25 mgd. Year 2009 represents a five-year planning interval, and 2023 is the Master Plan's 20-year planning horizon. The year 2023 is also the planning horizon for this Draft SEIS. Table 2.1-2 compares projected flows for each of the treatment alternatives/options.

Table 2.1-2. Comparison of Wastewater Flow Projection for Alternative Treatment and Discharge Options

Alt.	Description		Projected Flows for all Alternatives (in approx. mgd for 2004/2009/2023)						
			Treatment Options			Discharge Options			
			Treated at SBIWTP	Treated at Public Law 106-457 Facility	Treated at SABWWTP	Discharged to SBOO in the United States	Discharged to Punta Bandera (Treated Effluent)	Discharged to Punta Bandera (Untreated Effluent)	Discharged to Tijuana River
1	No Action Alternative (Continue Operation of SBIWTP as Advanced Primary Facility)	Option A	25/25/25	0/0/0	25/25/25	25/25/25	25/25/25	6/15/25	0/0/9
		Option B	25/25/25	0/0/0	25/25/25	25/25/25	25/25/25	6/15/34	0/0/0
2	Operate SBIWTP as Advanced Primary Facility with Treated Flows Conveyed to Mexico		25/25/25	0/0/0	25/25/25	25/0/0	25/50/50	6/15/34	0/0/0
3	Operate the SBIWTP with City of San Diego Connections		25/25/25	0/0/0	25/25/25	25/5 to 0[a]/5 to 0[a] 0/9 to 14[b]/9 to 14[b]	25/36/36	6/15/34	0/0/0
4	<u>Options A and C</u> Public Law 106-457 Facility (Adv. Primary Treatment at SBIWTP + Secondary Treatment in Mexico)	Discharge Option I	25/25/25	0/40/59	25/25/25	25/40/59	25/25/25	6/0/0	0/0/0
		Discharge Option II	25/25/25	0/40/59	25/25/25	25/40/0	25/65/84	6/0/0	0/0/0
	<u>Option B</u> Public Law 106-457 Facility (Secondary Treatment in Mexico Only)	Discharge Option I	25/0/0	0/40/59	25/25/25	25/40/59	25/25/25	6/0/0	0/0/0
		Discharge Option II	25/0/0	0/40/59	25/25/25	25/0/0	25/65/84	6/0/0	0/0/0
5	Secondary Treatment in the United States (c)	Option A	25/25/25	0/0/0	25/25/25	25/25/25	25/25/25	6/15/34	0/0/0
		Options B1 and B2	25/25/25	0/0/0	25/25/25	25/25/25	25/25/25	6/15/34	0/0/0
6	Secondary Treatment at SBIWTP and in Mexico		25/25/25	0/15/34	25/25/25	25/40/59	25/25/25	6/0/0	0/0/0
7	Closure/Shutdown of SBIWTP		0/0/0	0/0/0	0/0/0	0/0/0	25/25/25	31/40/59	0/0/0

Notes:
(a) Denotes range of effluent that would be treated at South Bay Water Reclamation Plant and discharged to SBOO.
(b) Denotes range of effluent that would be treated at Point Loma Wastewater Treatment Plant and discharged to Point Loma Outfall.
(c) Alternative 5 Option B-1 is activated sludge with flow equalization; Option B2 is activated sludge with expanded capacity to accommodate peak flows.

Except for Alternative 4, Option B (Public Law 106-457 facility with all treatment in Mexico), and Alternative 7 (SBIWTP Closure/Shutdown), all the alternatives evaluated in this Draft SEIS incorporate some form of primary treatment of wastewater from Tijuana in the United States. One fundamental assumption for the alternatives is that Mexican conveyance facilities, both the original conveyance channel (OCC) and the parallel conveyance line (PCL), are each sized to handle average flows of 50 mgd. A peak flow of 100 mgd can be conveyed to the two plants: 50 mgd to SBIWTP and 50 mgd to SABWWTP. An average of 25 mgd would be treated at the SBIWTP and 25 mgd at the SABWWTP.

mgd	lps
5	219
6	263
9	394
12	526
15	657
25	1,095
29	1,270
31	1,358
34	1,489
36	1,577
40	1,752
50	2,190
59	2,584
65	2,847
84	3,679
100	4,380
174	7,621
333	14,585

Preliminary costs for each of the alternatives were developed and are included in Appendix F.

Much of the discussion in this chapter incorporates the prior environmental impact statements and Records of Decision (ROD) prepared for the SBIWTP.

2.2 DESCRIPTION OF THE ALTERNATIVES

2.2.1 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Treatment at the SBIWTP was initiated in September 1997 as an advanced primary plant with discharge initially through an emergency connection to the City of San Diego Point Loma Wastewater Treatment Plant (PLWTP). In January 1999, the SBIWTP began discharging through the completed South Bay Ocean Outfall (SBOO). The SBOO consists of a 2.6-mile tunnel with sections buried 200 feet beneath the ocean floor and 1 mile of pipe on the ocean floor. The outfall discharges about 95 feet below the ocean surface. The average and peak capacity of the SBOO is 174 mgd and 333 mgd, respectively (CH2M Hill, 1998a).

This SEIS evaluates two options for the No Action Alternative. Option A assumes that Mexico does not improve its conveyance facilities to accommodate future flows to avoid dry weather flows to the Tijuana River. Option B assumes that Mexico does rehabilitate and expand its original open air conveyance channel (i.e., replace with a pipeline that increases capacity), so that during dry weather the OCC and the new PCL can together handle all the wastewater flows generated daily in the Tijuana region, less the 25 mgd that is treated at the SBIWTP. As a result, dry weather flows to the Tijuana River would be avoided. Under both options of the No Action Alternative, the USIBWC would continue to accept and treat an average of 25 mgd of Tijuana sewage at the advanced primary facility and would continue its current management practices at the SBIWTP.

Alternative 1 Option A (USIBWC Continues Operating SBIWTP as Advanced Primary Facility and Mexico Does Not Rehabilitate Its Original Conveyance Channel)

Under the No Action Alternative – Option A, the SBIWTP would continue to operate, providing advanced primary treatment for average flows of 25 mgd and peak flows of 50 mgd. All treated effluent would be discharged through the SBOO. This alternative represents the last phase of interim operating conditions of the SBIWTP as discussed in the 1996 Interim Operation SEIS, without the detention/flow equalization basin, which has not been constructed, and reflects current (i.e., existing) operations. Pump Station 1/1A would operate in a way that results in daily peak flows of 50 mgd being directed to the SBIWTP. Combined with low flows, the average flow to the SBIWTP would be 25 mgd.

Remaining flows of up to 50 mgd would be conveyed to Mexico's SABWWTP via the PCL. Of this total, 25 mgd would be treated at the SABWWTP. The rest would bypass treatment at the SABWWTP and be discharged untreated to the shoreline at Punta Bandera. Under Alternative 1 Option A, the OCC would not be used. Sewage flows beyond the capacity of the United States or Mexican treatment and conveyance systems would not be treated in either country and could eventually reach the Tijuana River and flow northward into the United States.

Figure 2.2.1-1 shows the physical features of Alternative 1 (Options A and B). Figure 2.2.1-2 is an operational schematic of SBIWTP facilities for Alternative 1 Options A and B.

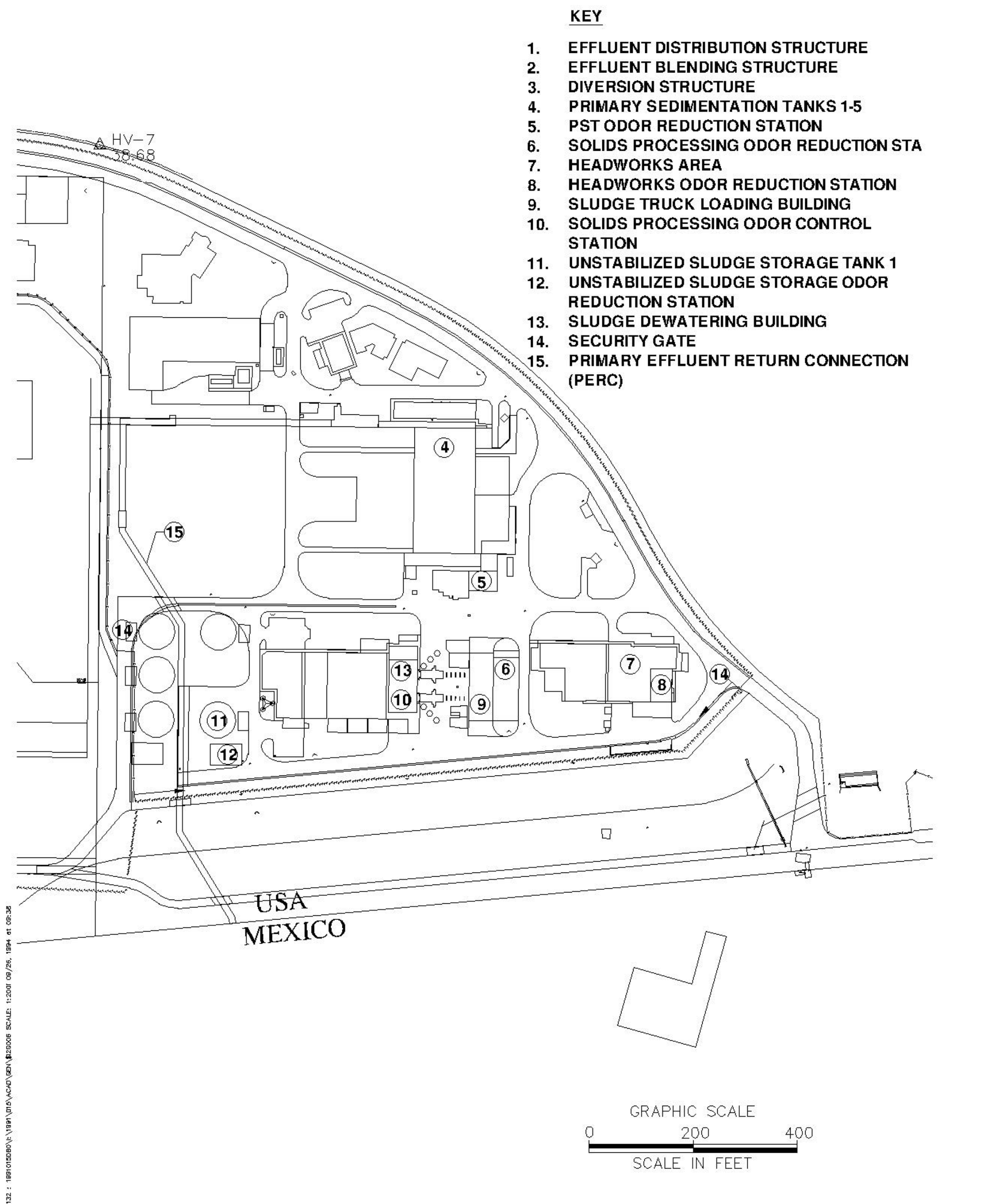
This alternative would not require new treatment facilities at the SBIWTP and assumes no improvements would be made to Mexico's treatment or conveyance systems. The existing advanced primary facilities would treat an average monthly organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd with a 50 mgd peak.

Advanced primary treatment is designed to provide an approximate effluent quality of 204 mg/L BOD_5 and 88 mg/L TSS.

Existing and Projected Flows under Alternative 1 – No Action Alternative, Option A

Flows Discharged to United States Waters. Table 2.2.1-1 gives existing and projected flows for Alternative 1 Option A, in which advanced primary treated flows would be discharged through the SBOO into United States waters under average flow conditions. However, by 2023, substantial dry weather sewage flows could be expected into the Tijuana River, which would flow northward across the border into the United States, as well as flows from winter storm runoff or equipment failures.

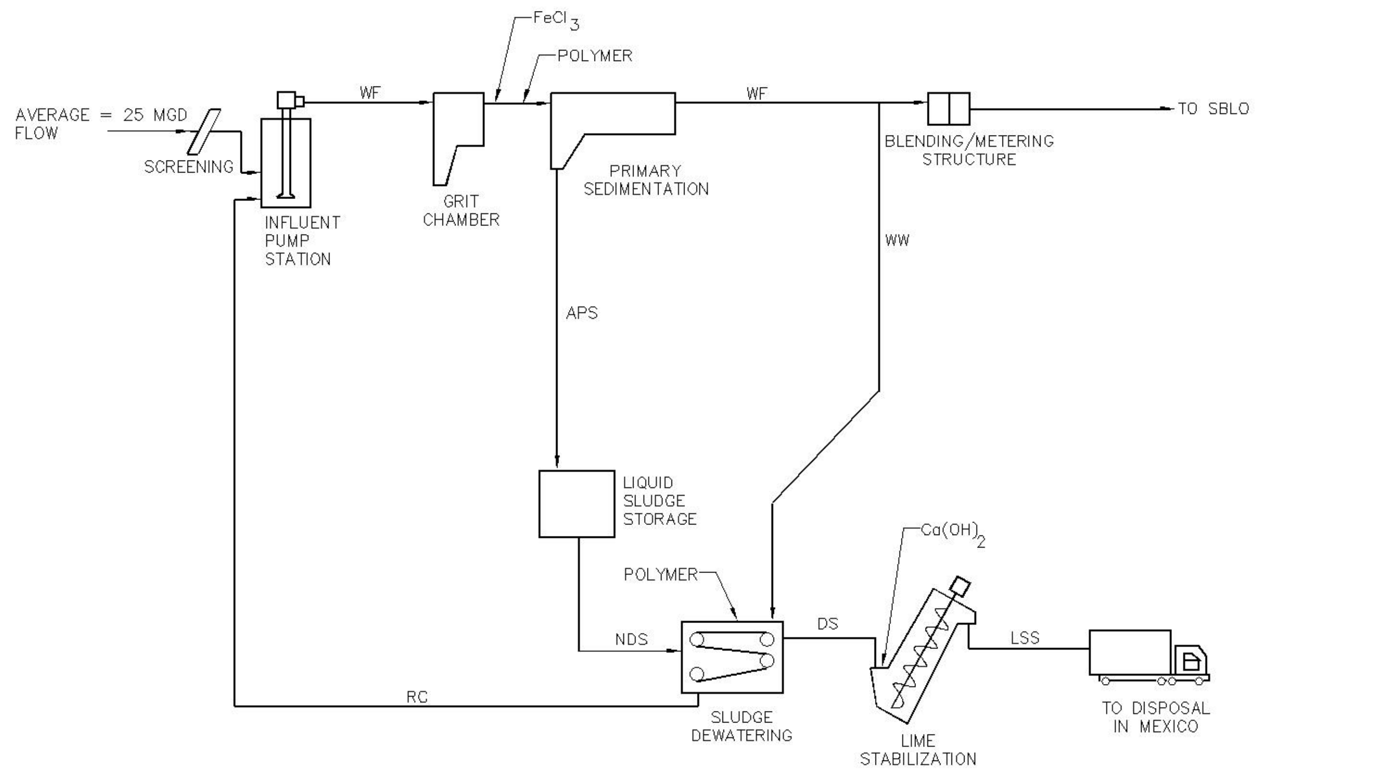
Untreated Flows Discharged in Mexico. With the No Action Alternative – Option A, untreated flows (in the Tijuana collection system) would continue to be discharged to the shoreline in Mexico. As Table 2.2.1-1 shows, untreated flows discharged to the shoreline are projected to be 6 mgd in 2004. By 2009, wastewater generation would continue to exceed the capacity of Mexico's collection, conveyance, and treatment facilities, increasing discharges to the shoreline to 15 mgd in 2009 to 25 mgd in 2023. In addition, by 2023, up to 9 mgd of untreated flows would be discharged to the Tijuana River in dry weather conditions.



Source: CH2M Hill, 1999

NORTH

Figure 2.2.1-1. Physical Features of the No Action Alternative (Advanced Primary Treatment at the SBIWTP)



LOADINGS

BOD_5 = 370 mg/L
TSS = 350 mg/L

PRIMARY TREATMENT REMOVALS

BOD_5 = 45%
TSS = 75%

FLOW STREAM

APS = ADVANCE PRIMARY SLUDGE
$Ca(OH)_2$ = CALCIUM CARBONATE
DS = DEWATERED SLUDGE
$FeCl_3$ = FERRIC CHLORIDE
LSS = LIME STABILIZED SLUDGE

NDS = NONDEWATERED SLUDGE
RC = RECYCLED WATER
WW = WASHWATER
WF = TREATED WASTEWATER FLOW

EXISTING SBIWTP FACILITIES

SBIWTP = SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT
SBLO = SOUTH BAY LAND OUTFALL

Source: CH2M Hill, 1999

Figure 2.2.1-2. No Action Alternative (Advanced Primary) System Operations

Table 2.2.1-1. Existing and Projected Flows for Alternative 1 – No Action Alternative, Option A (Continued Operation of SBIWTP as Advanced Primary Facility)

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary)	25	25	25
Treated Flows Discharged to SBOO (Advanced Primary)	25	25	25
Tijuana Flows Sent by Mexico to SABWWTP	31	40	50
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25
Untreated Flows Discharged to Punta Bandera/Bypassed at SABWWTP via PCL (Untreated Flows Discharged to Mexico Shoreline)	6	15	25
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	9

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) Master Plan 20-year Planning Horizon
PCL = Parallel Conveyance Line

Source: Parsons (September 2004)

Alternative 1 Option B (USIBWC Continues Operating SBIWTP as Advanced Primary Facility and Mexico Rehabilitates Its Original Open Air Conveyance Channel)

Under the No Action Alternative – Option B, the SBIWTP would continue to operate, providing advanced primary treatment for average flows of 25 mgd and peak flows of 50 mgd. No equalization of flow would be provided. All treated effluent would be discharged through the SBOO. Pump Station 1/1A would be operated in a way that results in daily peak flows of 50 mgd being directed to the SBIWTP. Combined with low flows, the average flow to the SBIWTP would be 25 mgd. Similar to Option A, under Alternative 1 Option B, the SBIWTP would continue to provide advanced primary treatment for average flows of 25 mgd and discharge through the SBOO. All other flows would remain within Mexico. However, with Alternative 1 Option B, average flows of 25 mgd would be conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd of average flows would be conveyed via the OCC, assuming that Mexico proceeds with rehabilitation and expansion of those conveyance facilities. All such excess flows conveyed via this system (i.e., the OCC) would bypass treatment at the SABWWTP to be discharged into the shoreline at Punta Bandera. This alternative does not require new treatment facilities at the SBIWTP.

Under this alternative, which assumes that Mexico would rehabilitate and expand its OCC, the existing SBIWTP advanced primary facilities would treat an average monthly organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd with a 50 mgd peak. Advanced primary treatment is designed to provide an approximate effluent quality of 204 mg/L BOD_5 and 88 mg/L TSS.

Existing and Projected Flows under Alternative 1 – No Action Alternative, Option B

Flows Discharged to United States Waters. Table 2.2.1-2 gives existing and projected flows for Alternative 1 Option B, in which flows would be discharged through the SBOO into United States waters under average flow conditions. Any sewage flows in the river would be from winter storm runoff or equipment failures.

Table 2.2.1-2. Existing and Projected Flows for Alternative 1 – No Action Alternative, Option B (Continued Operation of SBIWTP as Advanced Primary Facility)

Description	Average Day Flows (mgd)		
	2004 (1)	**2009**	**2023 (2)**
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary)	25	25	25
Treated Flows Discharged to SBOO (Advanced Primary)	25	25	25
Tijuana Flows Sent by Mexico to SABWWTP	31	40	59
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25
Untreated Flows Discharged at Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	15	34
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) Master Plan 20-year Planning Horizon
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel
Source: Parsons (September 2004)

Untreated Flows Discharged in Mexico. With the No Action Alternative Option B, untreated flows would continue to be discharged to the shoreline in Mexico at Punta Bandera. Untreated flows discharged to the shoreline are projected to be 6 mgd in 2004 (refer to Table 2.2.1-2). By 2009, wastewater generation would continue to exceed the capacity of Mexico's collection, conveyance, and treatment facilities, increasing discharges to the shoreline to 15 mgd in 2009 and to 34 mgd in 2023. No untreated flows would be discharged to the Tijuana River in dry weather conditions.

2.2.2 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Under Alternative 2, the SBIWTP would continue to operate as an advanced primary facility for average flows of 25 mgd and peak flows of 50 mgd. No SBIWTP advanced primary treated effluent would be discharged through the SBOO; instead, all effluent would be returned to Mexico. All other flows would remain within Mexico, with

25 mgd being conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd would be conveyed via the OCC, if Mexico undertakes the necessary rehabilitation. It would bypass treatment at the SABWWTP and would be discharged into the shoreline at Punta Bandera.

Currently, Mexico has advised the USIBWC that it does not have sufficient capacity to accept treated effluent back from the SBIWTP. As described in Subchapter 1.7.5, a new pumping and conveyance system has been constructed by Mexico as a parallel backup facility for the existing Mexican conveyance system, to pump an average flow of 25 mgd and peak of 50 mgd, to convey flows from Pump Station 1/1A to the SABWWTP in Mexico. The new parallel pumping and conveyance system, or PCL, was originally intended as backup for the existing system to allow for needed repairs to Tijuana's existing system. However, this system is now the primary conveyance system. Figure 2.2.2-1 shows the pumping and conveyance system location.

Under Alternative 2, the treated effluent would be sent to Tijuana via the SBIWTP's primary effluent return connection (PERC) conveyance and pumping facilities, completed in 2004, and by the PCL. If the treated effluent does not enter the SABWWTP, it would be discharged to the surf at a point about 5.6 miles south of the United States border, at Punta Bandera. The new pumping and conveyance system to the treatment works in SABWWTP would continue to operate.

All other flows would remain within Mexico, with 25 mgd being conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd would be conveyed via the OCC by 2023; it would bypass treatment at the SABWWTP and would be discharged into the shoreline at Punta Bandera.

Figure 2.2.2-2 shows the physical layout of this alternative, and Figure 2.2.2-3 shows an operational schematic of SBIWTP facilities for this alternative.

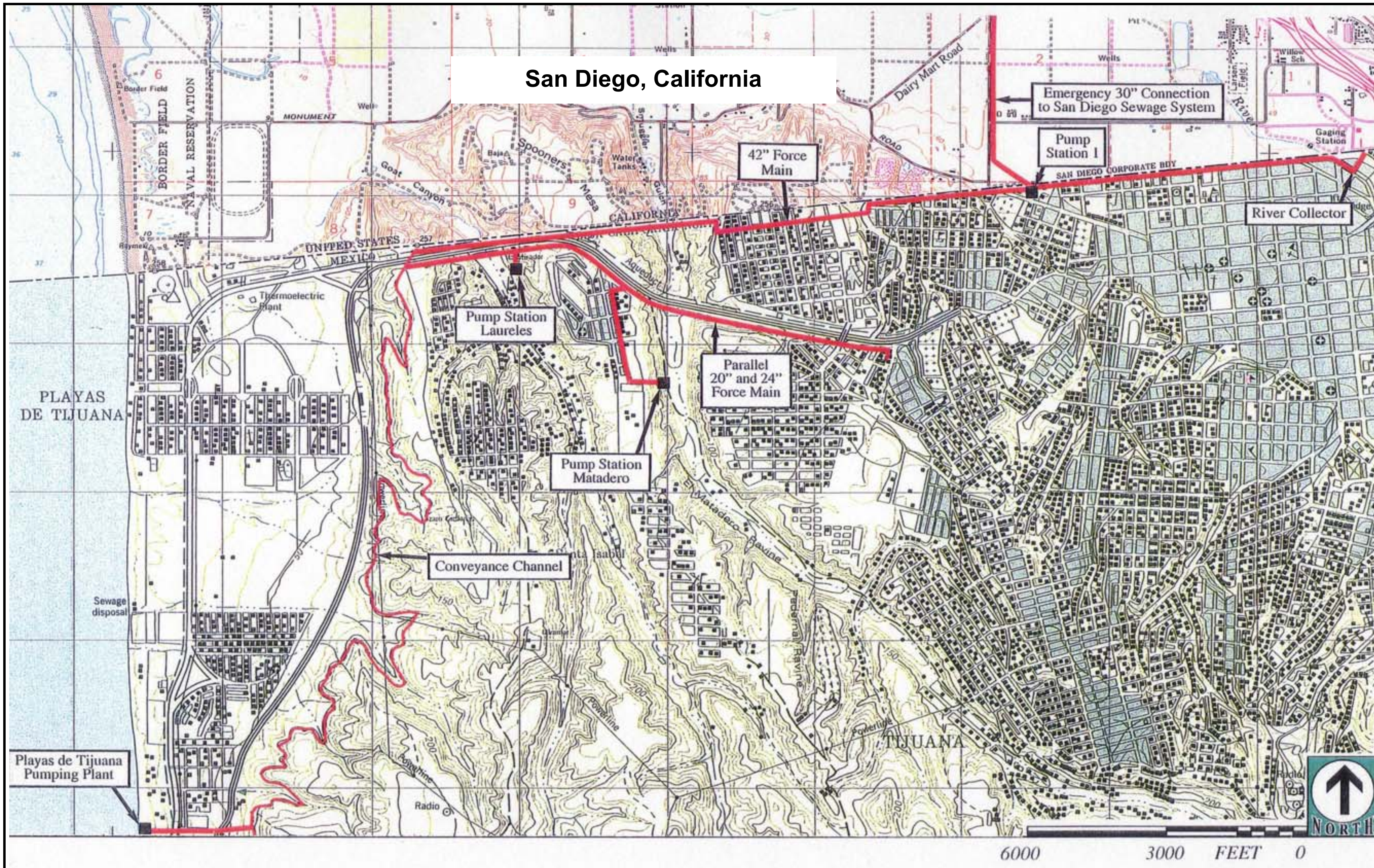
The following improvements to the OCC in Mexico would be required to implement this alternative:

- Refurbish Pump Station 1
- Install new pumps and new motors
- Install a new conveyance pipeline (force main) with increased capacity from Pump Station 1 to Playas de Tijuana

It should be noted that the CESPT has expressed objections to this alternative because it would eliminate the redundancy of their conveyance line and reduce operational flexibility.

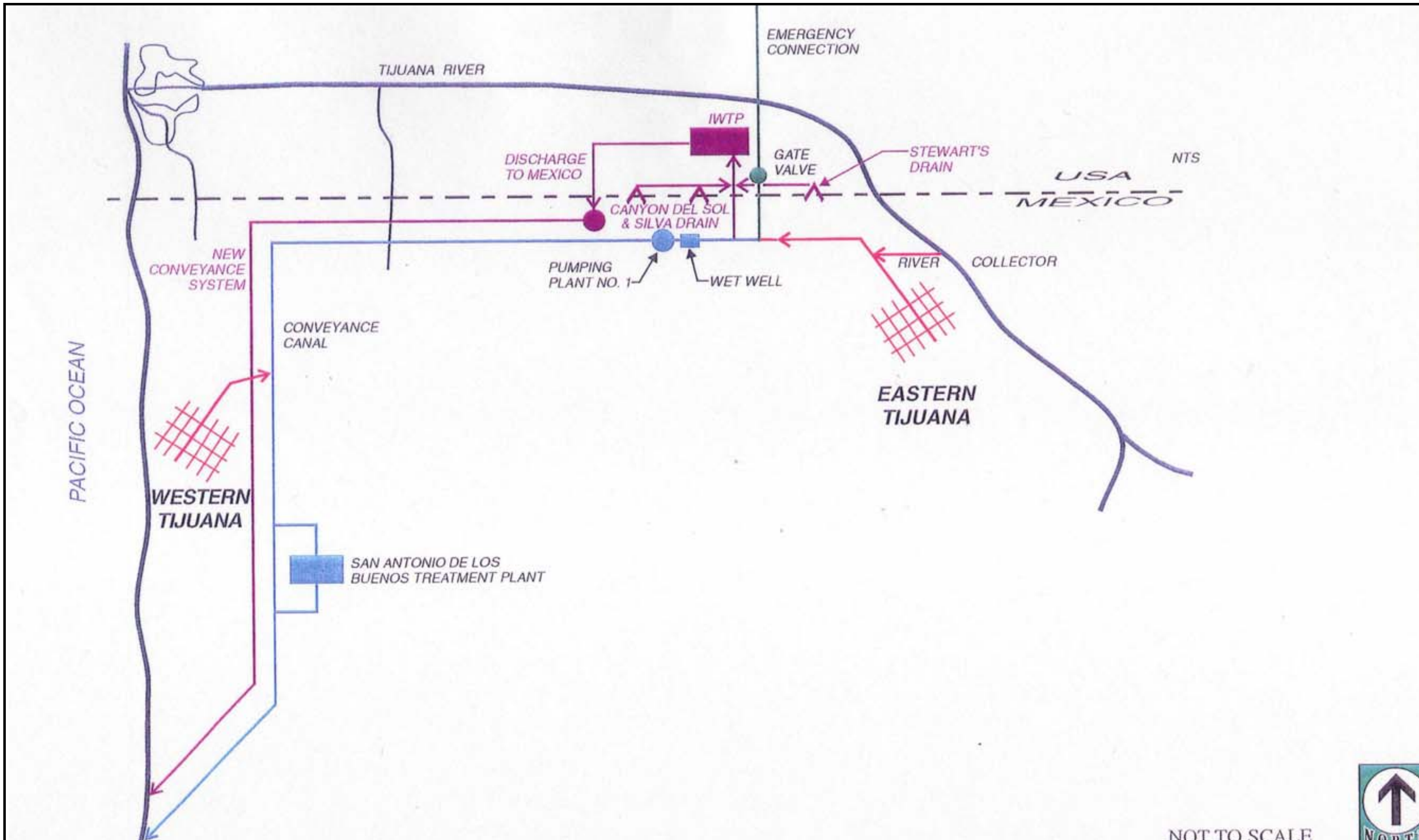
Existing and Projected Flows under Alternative 2

Untreated Flows Discharged in Mexico. Table 2.2.2-1 gives the projected flows for the Alternative 2, which would result in the discharge of advanced primary treated effluent to the shoreline in Mexico. In addition, Tijuana's wastewater generation would continue to exceed the capacity of its collection, conveyance, and treatment system, increasing the discharge of untreated flows to the shoreline. In 2004, an estimated 6 mgd of untreated flows were discharged to the shoreline in Mexico. This is projected to increase to 15 mgd by 2009 and to 34 mgd by 2023, similar to the situation described for the No Action Alternative (Alternative 1 Option B).



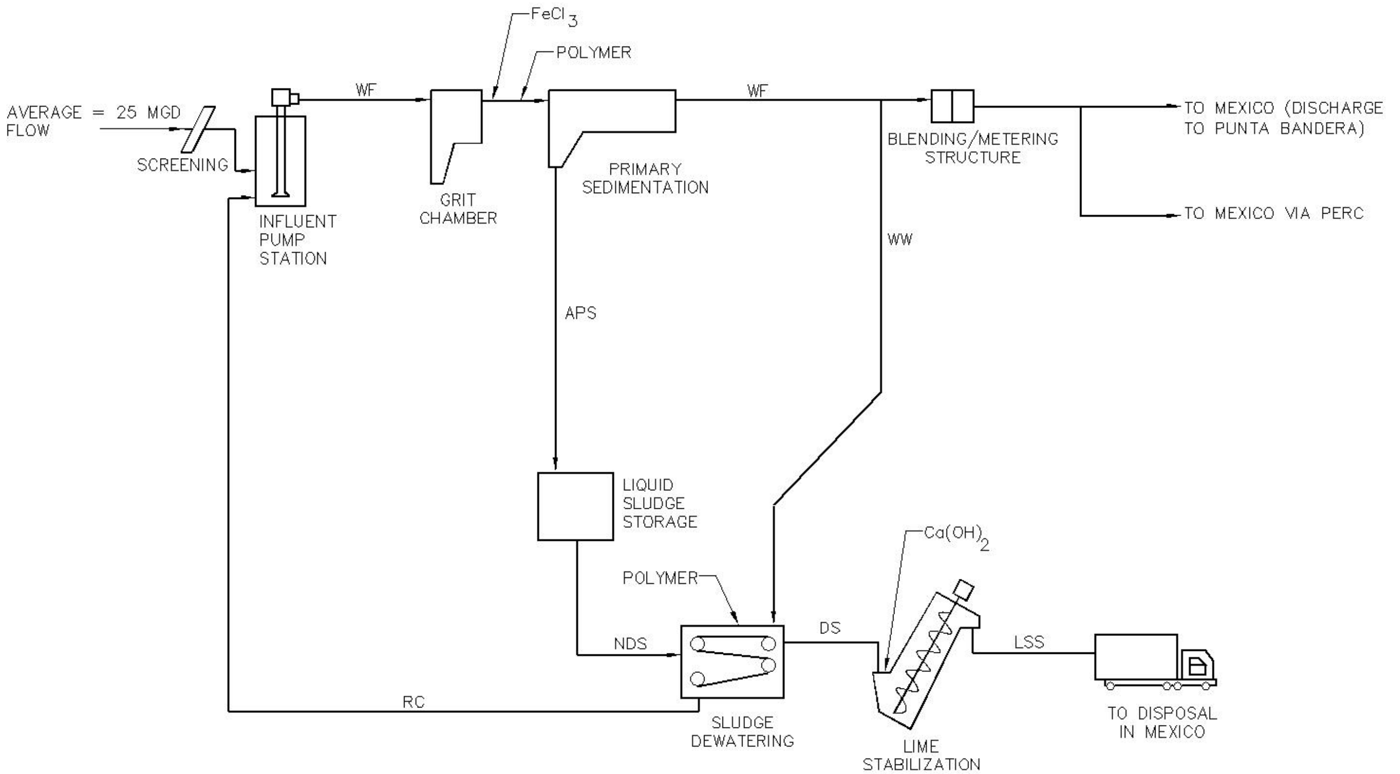
Source: modified from RECON, 1996

Figure 2.2.2-1. Existing Pumping and Conveyance Facilities in Mexico



Source: modified from RECON, 1996

Figure 2.2.2-2. Physical Features of Alternative 2 – SBIWTP with Treated Flows Returned to Mexico



LOADINGS

BOD_5 = 370 mg/L
TSS = 350 mg/L

PRIMARY TREATMENT REMOVALS

BOD_5 = 45%
TSS = 75%

FLOW STREAM

APS = ADVANCE PRIMARY SLUDGE
$Ca(OH)_2$ = CALCIUM CARBONATE
DS = DEWATERED SLUDGE
$FeCl_3$ = FERRIC CHLORIDE
LSS = LIME STABILIZED SLUDGE

NDS = NONDEWATERED SLUDGE
RC = RECYCLED WATER
WW = WASTEWATER
WF = TREATED WASTEWATER FLOW

——— EXISTING SBIWTP FACILITIES

SBIWTP = SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT
SBLO = SOUTH BAY LAND OUTFALL

Source: modified from CH2M Hill, 1999

Figure 2.2.2-3. Operational Schematic for Alternative 2 Option A – SBIWTP with Treated Flows Returned to Mexico via PERC/Mexican Facilities

Table 2.2.2-1. Existing and Projected Flows for Alternative 2 (Operate SBIWTP as Advanced Primary Facility with Treated Flows Conveyed to Mexico via PERC & Mexico Facilities)

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary)	25	25	25
Treated Flows Discharged to SBOO (Advanced Primary)	25	0	0
Tijuana Flows Sent by Mexico to SABWWTP	31	65	84
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged to Punta Bandera from SBIWTP and SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	50 (3)	50 (3)
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	15	34
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP).
(2) Master Plan 20-year Planning Horizon.
(3) Represents 25 mgd of treated flows from SBIWTP and 25 mgd of treated flows from SABWWTP
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel

Source: Parsons (September 2004)

2.2.3 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of the SBIWTP Effluent to the City of San Diego Facilities with Remainder of the SBIWTP Effluent Return to Mexico

Under Alternative 3, the SBIWTP would continue to operate as an advanced primary facility at its current 25-mgd capacity and would send up to 14 mgd to San Diego city treatment facilities. The SBIWTP would also return 11 mgd of treated effluent to Mexico via its OCC. Direct discharges by the SBIWTP to the SBOO would cease. This alternative would be a potential interim alternative for the SBIWTP, while secondary facilities were being constructed, and would require agreement by the City of San Diego. It would also require agreement by the Government of Mexico to accept the returned effluent and to expand the capacity of the OCC.

The Rules, Finance and Intergovernmental Relations Committee of the San Diego City Council voted unanimously in 2002 to deny any request from the USIBWC to treat effluent from the SBIWTP at the SBWRP and/or the PLWTP because of toxicity of Tijuana wastewater, handling of sludge, reduced capacity, and reclaimed water concerns (City of San Diego, 2003c). Further, on October 11, 2004, and in prior correspondence, the City of San Diego has advised the USIBWC that its facilities are not currently available to treat Tijuana sewage on an interim basis or otherwise. If circumstances were to change and the City's facilities were to made available to USIBWC under this potential interim alternative, the SBIWTP would send its advanced primary effluent to two existing City of San Diego treatment facilities, specifically the South Bay Water Reclamation Plant (SBWRP), a tertiary plant, or the PLWTP, an advanced primary plant, to complete the wastewater treatment process and discharge the treated effluent. Advanced primary treated or screened effluent would be sent to the SBWRP for secondary treatment via a new connection, with treated effluent discharged through the SBOO. In addition, screened effluent would be sent to the PLWTP via the City's South Metro Interceptor, where it would be treated and discharged through the Point Loma Outfall.

Under this alternative, a total of 14 mgd of advanced primary treated effluent or 14 mgd of screened effluent would be sent to the SBWRP or the PLWTP. The remaining 11 mgd of advanced primary effluent from the SBIWTP would be returned to Mexico via its OCC, where it would be blended with untreated wastewater and discharged at Punta Bandera. This alternative assumes that the Government of Mexico agrees to accept the return of the treated effluent and expands the capacity of its OCC. Alternative 3 also assumes that 25 mgd of flows generated by the City of Tijuana would be conveyed to the SABWWTP via Mexico's PCL.

A description follows of the existing City of San Diego treatment facilities, along with any new facilities that would be required.

South Bay Water Reclamation Plant

The SBWRP opened in May 2002 and is located at the intersection of Dairy Mart and Monument roads in the Tijuana River Valley, just west of the SBIWTP (Figure 1.3-1 shows the SBWRP location).

The SBWRP consists of secondary and tertiary treatment facilities having a wastewater treatment capacity of 15 mgd and provides wastewater treatment services/reclaimed water to San Diego's South Bay (City of San Diego, 2003a). The Grove Avenue Pump Station (GAPS) pumps wastewater from the City of San Diego Metropolitan Wastewater Department's (MWWD) South Metro Interceptor to the SBWRP. Treatment includes influent screening, grit removal, primary sedimentation, primary flow equalization, activated sludge processes, secondary sedimentation, coagulation, filtration, and ultraviolet light disinfection. Treated effluent from the plant currently meets federal CWA and California Ocean Plan standards. Excess effluent from the plant that cannot be reused is discharged to the ocean through the SBOO (BECC, 1997b).

Sludge generated at the SBWRP is pumped through a dedicated pipeline to the South Metro Interceptor Sewer for conveyance to the PLWTP for treatment and disposal.

Flows to the GAPS average 4 mgd. Additional flow will be diverted to the GAPS by the recently completed Otay River Pump Station (ORPS) and pipeline facilities. The OPRS contribution would increase wastewater flows to SBWRP to 10 mgd, leaving up to 5 of the SBWRP's 15 mgd capacity available for use by the SBIWTP. The SBWRP's available capacity is expected to decrease over time with development in the GAPS and ORPS service areas.

Point Loma Wastewater Treatment Plant

The PLWTP opened in 1963 and is located at 1902 Gatchell Road on the Point Loma bluffs (City of San Diego, 2003b). At present, the PLWTP provides advanced primary treatment for up to 180 mgd of wastewater generated by 2.2 million residents in a 450-square-mile service area. The plant has a 240-mgd treatment capacity (City of San Diego, 2004).

The PLWTP's treatment process includes effluent screening, grit removal, and primary sedimentation/primary clarification. The treated wastewater is discharged to the ocean through the Point Loma Outfall, which is 12 feet in diameter and 4.5 miles long. The structure terminates in 320 feet of water where it splits into a Y-shaped diffuser to ensure wide dispersal of effluent into ocean waters.

The organic solids removed from the wastewater are pumped into one of the eight digesters on site where their volume is reduced through a heat and bacterial process similar to human digestion. After about two weeks, this raw "sludge" is pumped from Point Loma through a 17-mile pipeline to the Metro Biosolids Center for further processing.

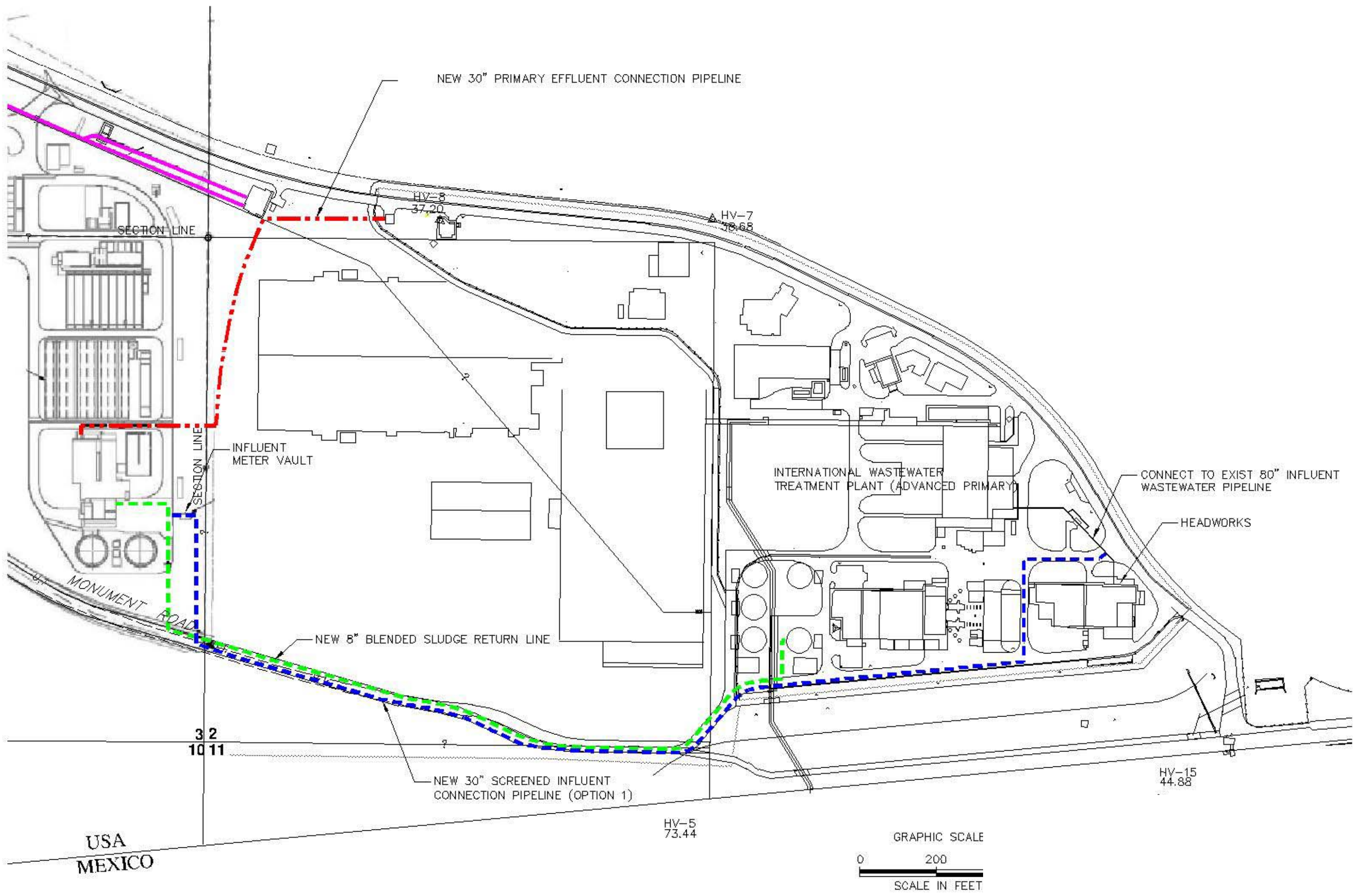
In November 1995, the City of San Diego received a modified wastewater discharge permit (also called a "Section 301(h) waiver") from secondary treatment requirements of the CWA. This modified permit was renewed in September 2002 (City of San Diego, 2003b). Through a combination of factors, including industrial source control, advanced primary treatment of wastewater, a deep ocean outfall, and comprehensive environmental monitoring, the EPA and the San Diego RWQCB agreed that the PLWTP fully protects the ocean.

In this alternative, 14 mgd of advanced primary treated effluent or 14 mgd of screened effluent would be sent to the SBWRP and/or the PLWTP. As discussed above, the SBWRP could accommodate up to 5 mgd of advanced primary treated/screened effluent from the SBIWTP. Therefore, Alternative 3 would convey from 9 to 14 mgd of screened effluent to the PLWTP for treatment and disposal.

New facilities and a new 30-inch pipeline would be required to convey the treated or screened effluent from the SBIWTP to the SBWRP and to return primary and secondary waste sludge to the SBIWTP's solids handling facilities. The effluent pipeline would be aligned along the south side of the SBIWTP, generally parallel to Monument Road, to the SBWRP's influent metering vault for about 3,200 feet. The existing influent pumps at the SBIWTP would be used to pump effluent to the SBWRP. Sludge generated at the SBWRP would be pumped to the SBIWTP via a new 8-inch pipeline (sludge pipeline) aligned parallel to the 30-inch effluent pipeline from the SBWRP to the SBIWTP.

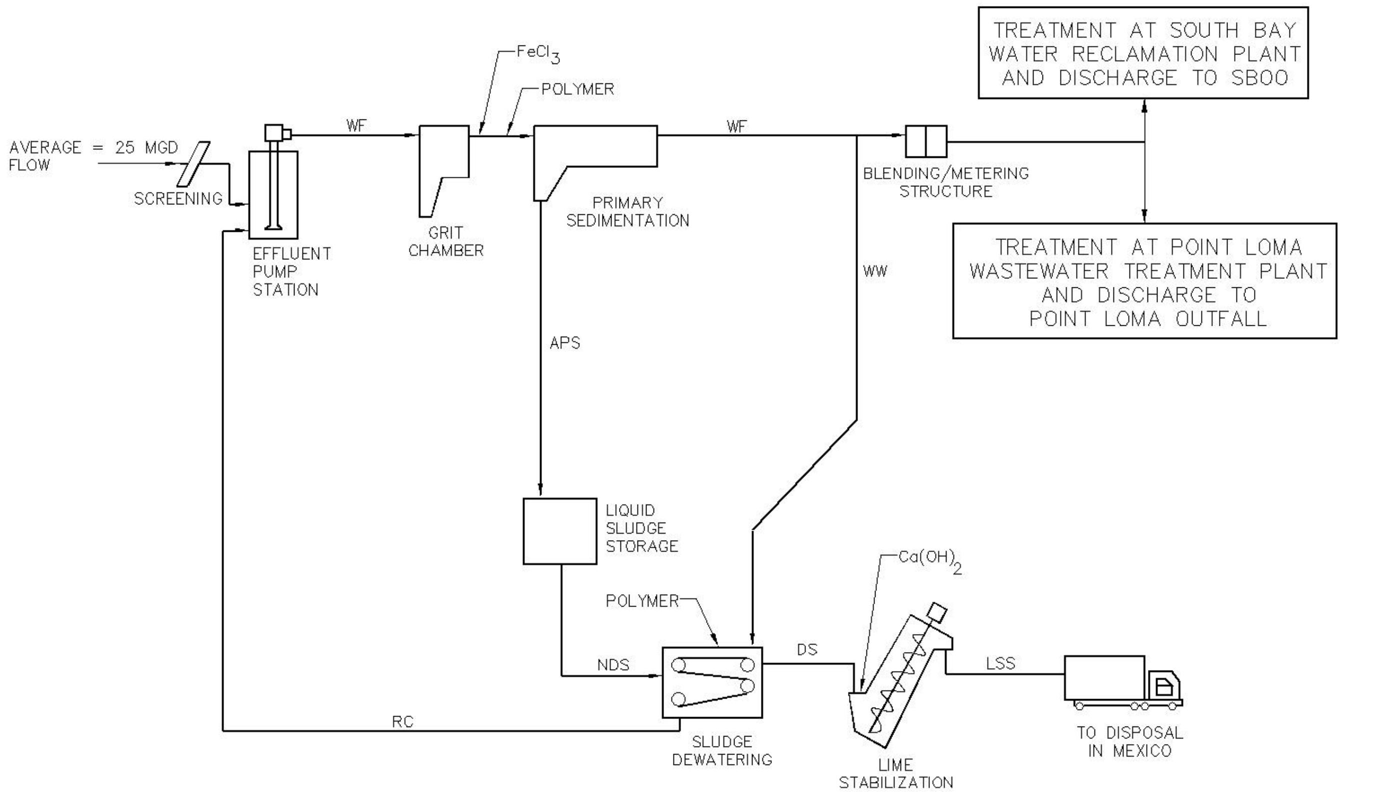
Figure 2.2.3-1 shows the physical layout of the facilities at the SBIWTP and the SBWRP, including the alignment of the effluent and the sludge pipelines interconnecting the two.

The City's existing South Metro Interceptor would be used to convey screened effluent from the SBIWTP to the PLWTP. As previously described, sludge generated at the PLWTP would be processed at the City's Metro Biosolids Center. Figure 2.2.3-2 shows an operational schematic of facilities at the SBIWTP for Alternative 3.



Source: Parsons

Figure 2.2.3-1. Physical Features of Alternative 3 - Operate SBIWTP with City of San Diego Connections



LOADINGS

BOD_5 = 370 mg/L
TSS = 350 mg/L

PRIMARY TREATMENT REMOVALS

BOD_5 = 45%
TSS = 75%

FLOW STREAM

APS = ADVANCE PRIMARY SLUDGE
$Ca(OH)_2$ = CALCIUM CARBONATE
DS = DEWATERED SLUDGE
$FeCl_3$ = FERRIC CHLORIDE
LSS = LIME STABILIZED SLUDGE

NDS = NONDEWATERED SLUDGE
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WW = WASTEWATER
WF = TREATED WASTEWATER FLOW

——— EXISTING SBIWTP FACILITIES

SBIWTP = SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT
SBLO = SOUTH BAY LAND OUTFALL

Source: modified from CH2M Hill, 1999

Figure 2.2.3-2. Operational Schematic for Alternative 3 – Operate SBIWTP with City of San Diego Connections

Existing and Projected Flows under Alternative 3

Untreated Flows Discharged in Mexico. Table 2.2.3-1 gives the existing and projected flows for Alternative 3. As Table 2.2.3-1 shows, untreated flows discharged to the shoreline are projected to be 6 mgd in 2004. By 2009, the flow volumes discharged to the shoreline at Punta Bandera would increase to 26 mgd and to 45 mgd in 2023; however, these flows would consist of advanced primary effluent from the SBIWTP and untreated wastewater that would be bypassed at SABWWTP.

Table 2.2.3-1. Existing and Projected Flows for Alternative 3 (Operate SBIWTP with City of San Diego Connections)

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary)	25	25	25
Treated Flows Sent to City of San Diego Facilities for Additional Treatment at PLWTP and/or SBWRP	0	14	14
Treated Flows Discharged to SBOO (Advanced Primary) (3)	25	0 to 5	0 to 5
Treated Flows Discharged to PLWTP Outfall (4)	0	9 to 14	9 to 14
Tijuana Flows Sent by Mexico to SABWWTP	31	51 (5)	70
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged at Punta Bandera from SBIWTP and SABWWTP via OCC (Treated Flows Discharged to Mexico Shoreline)	0	36 (6)	36 (6)
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	15	34
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) Master Plan 20-year Planning Horizon.
(3) Represents discharge of treated flows from SBIWTP in 2004 and from SBWRP in 2009 and 2023.
(4) Represents discharge of treated flows from PLWTP.
(5) Represents 11 mgd of treated flows from SBIWTP + remainder of untreated flows for 2009 retained in Mexico.
(6) Represents discharge of 25 mgd of treated flows from SABWWTP + 11 mgd of treated flows from SBIWTP.
(7) Represents 11 mgd of treated flows from SBIWTP + remainder of untreated flows for 2023 retained in Mexico.
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel

Source: Parsons (September 2004)

Because the SBWRP has insufficient capacity to treat 15 mgd of wastewater, this alternative was eliminated from further consideration. In addition, the Rules, Finance and Intergovernmental Relations Committee of the San Diego City Council voted unanimously in 2002 to deny any request from the USIBWC to treat effluent from the SBIWTP at the SBWRP and/or the PLWTP because of toxicity of Tijuana wastewater, handling of sludge, reduced capacity, and reclaimed water concerns (City of San Diego, 2003c).

2.2.4 Alternative 4: Public Law 106-457 (Secondary Treatment Facility in Mexico)

On November 6, 2000, Congress enacted Public Law 106-457 (*Estuaries and Clean Waters Act of 2000*), which President Clinton signed into law. Title VIII, *Tijuana River Valley Estuary and Beach Cleanup*, states that, subject to the negotiation of a new treaty minute, the USIBWC is authorized to take the necessary measures to provide secondary treatment in Mexico of up to 75 mgd as follows:

- Secondary treatment of 25 mgd of advanced primary effluent from the SBIWTP, if such treatment is not provided for at a facility in the United States.
- Secondary treatment of 25 mgd of additional wastewater generated in Mexico.
- Secondary treatment of up to another 25 mgd of effluent from Mexico, subject to the results of the comprehensive plan.

House Rule (H.R.) 4794, passed by Congress on November 16, 2004, and signed into law by the President on November 30, 2004, amends *Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000* to reauthorize and update the authority to comprehensively address the treatment of sewage emanating from the Tijuana, Mexico area that flows untreated or partially treated into the United States, causing significant adverse public health and environmental impacts. One of the purposes of H.R. 4794 was to reflect the passage of Treaty Minute 311. The legislation also increases the total authorization of appropriations from $156 million to “such sums as may be necessary” and eliminates the expiration of the authorization of funding.

Public Law 106-457 allows secondary effluent from the facility to be reused in Mexico or in the United States (after additional treatment) or to be discharged through the SBOO in compliance with the water quality laws of the Untied States and California. Under Public Law 106-457, the facility was envisioned as a privately constructed and owned wastewater treatment facility located in Mexico. The facility owner would recover the costs of development, financing, and construction, plus the annual cost of operation and maintenance under a 20-year contractual arrangement.

Consistent with Public Law 106-457, the United States and Mexican sections of the International Boundary and Water Commission (IBWC) signed Minute 311, *Recommendations for Secondary Treatment in Mexico of the Sewage Emanating from the Tijuana River Area in Baja California, Mexico,* on February 20, 2004. This Minute envisions the construction and operation in Mexico of a plant and related facilities for secondary treatment of sewage from the Tijuana River area in Mexico that flows untreated into the United States or is partially treated at the SBIWTP. Under the terms of Minute 311, secondary treatment of advanced primary effluent from the SBIWTP and treatment of additional Tijuana sewage would be provided as follows, if secondary treatment is not provided in the United States:

- Subject to availability of annual appropriations, the USIBWC would fund up to $156 million for the engineering and construction, and for a 20-year period the operation and maintenance of a 59 mgd wastewater treatment plant in Mexico (including all process, pumping and conveyance facilities) if the secondary treatment of 25 mgd of advanced primary effluent from the SBIWTP is not provided in the United States. Any additional costs would be subject to subsequent Commission agreements. The Government of Mexico would continue to cover the corresponding costs for the first 25 mgd as stipulated in Minutes 283 and 296.

- Plant capacity would be consistent with the Tijuana Master Plan undertaken by the EPA and the CESPT to determine future infrastructure needs through 2023.
- Effluent not reused in Mexico or the United States could be discharged through the SBOO and would comply with applicable water quality laws of the United States and the state of California.
- The project would be implemented through an agreement with a private contractor for the design, construction, and operation of the project with a contract term of 20 years.
- Commission oversight of contractor selection and monitoring and evaluation of treatment plant performance would be as in previous Commission projects.
- The final design of the facilities to be constructed in Mexico and the final arrangement for implementation, as well as the terms under which the USIBWC would pay for the design, construction, operation and maintenance of said facilities, would be established in a subsequent IBWC Minute . If agreement on an operating lease arrangement or design acceptable to both governments is not reached, the stipulations established in IBWC Minutes 283 and 296 would apply.

Treatment Options

This Alternative includes three treatment options for implementing Public Law 106-457/Minute 311:

- **Option A:** Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
- **Option B:** Cease Operation of SBIWTP and conduct all Secondary Treatment in Mexico
- **Option C:** Bajagua LLC Proposal – Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment in Mexico

At present, the specific facilities required to implement Public Law 106-457 and Minute 311 have not been fully identified. Therefore, assumptions must be made about the characteristics of this alternative. The assumptions used to evaluate Options 4A and 4B include the relevant Public Law 106-457 assumptions included in the Master Plan (Appendix P) and are presented below:

- Required facilities include a pump station (for Alternative 4 Option A only) on the SBIWTP to pump the plant's advanced primary effluent to the Public Law 106-457 facility (sized to pump an average of 25 mgd), a pipeline to transport treated effluent from the SBIWTP to the Public Law 106-457 facility, a pump station to transport flows from the Tijuana collection system to the Public Law 106-457 facility (sized to pump 34 mgd), and a pipeline to return treated effluent from the Public Law 106-457 facility to SBIWTP for discharge.
- A Public Law 106-457 treatment plant in the area conceptually presented in the Master Plan (in the Alamar River basin).

- The plant will have a 59-mgd capacity. Future expansion beyond the 59 mgd capacity recommended in the Master Plan is not considered.
- Secondary treatment would be performed in compliance with the Federal Water Pollution Control Act.
- Treated effluent would comply with the water quality requirements of NPDES Permit No. CA0108928 and could be discharged through the SBOO.
- All sludge produced would be the responsibility of the facility owner/operator under the fee-for-service contract established as part of Public Law 106-457.
- The Master Plan assumes that operations would begin in 2006. However, for modeling purposes, this Draft SEIS assumes operations would commence in 2009 as a worst-case scenario.

Discharge Options

Alternative 4 also includes two options for discharging secondary treated effluent from the Public Law 106-457 treatment facility. Option I consists of discharging into the United States through the SBOO. It would not require new facilities at SBIWTP or at the Public Law 106-457 treatment site beyond those described in Subchapter 2.2.1.

Option II consists of retaining treated effluent in Mexico and discharging it at Punta Bandera. Comments on this option were received during the public scoping period. Due to the topographic differences between the Public Law 106-457 treatment plant (near the Alamar River) and Punta Bandera, returning treated effluent for disposal under Option II could not be accomplished via a gravity flow line. Instead, it would require a pump station at the Public Law 106-457 plant (sized to pump up to an average of 59 mgd) and a force main between the plant and Pump Station 1/1A. From Pump Station 1/1A treated effluent would be conveyed via the OCC, bypassing treatment at the SABWWTP to be discharged into the shoreline at Punta Bandera. It is also assumed that Mexico would improve its OCC (i.e., replace it with a pipeline that increases capacity) to convey the treated effluent to Punta Bandera.

Both Public Law 106-457 and Minute 311 allow the treated effluent to be reused in Mexico or in the United States (after additional treatment). However, potential reuse customers and the additional wastewater treatment and infrastructure that would be required have not been identified. Therefore, the reuse option is not evaluated in this Draft SEIS.

2.2.4.1 Alternative 4 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP's Effluent in Mexico

Under Alternative 4 Option A, the SBIWTP would continue to operate as an advanced primary facility for average flows of 25 mgd and peak flows of 50 mgd with 25 mgd of primary treated effluent sent to a secondary treatment facility to be constructed in Mexico (Public Law 106-457 facility). All other flows would remain within Mexico, with 25 mgd being conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd of raw sewage would be pumped to the Public Law 106-457 treatment facility, via a new Tijuana pumping station and conveyance line. This alternative would require the new facilities in the United States and Mexico previously described in Subchapter 2.2.2.1.

Existing and Projected Flows under Alternative 4 Option A

Untreated Flows Discharged in Mexico. Table 2.2.4-1 shows the existing and projected flows for Alternative 4 Option A with Discharge Options I and II. Under Alternative 4 Option A, both options would result in the discharge of 6 mgd of untreated flows to the shoreline in Mexico in 2004. These flows would be eliminated once the Public Law 106-457 facility begins operation in 2009.

Table 2.2.4-1. Existing and Projected Flows for Alternative 4: Public Law 106-457 Facility (Options A and C – 25 mgd Treated at SBIWTP) and Discharge Options I and II

Description	Average Day Flows (mgd)					
	2004 (1)		2009 (2)		2023 (3)	
Total Wastewater Flows in Tijuana	**56**		**65**		**84**	
Origin and Destiny of Wastewater	**Discharge Option I**			**Discharge Option II**		
	2004	**2009**	**2023**	**2004**	**2009**	**2023**
Flows Treated at SBIWTP (Advanced Primary)	25	25	25	25	25	25
Flows Sent to Public Law 106-457 Facility						
Treated Flows from SBIWTP Sent to Public Law 106-457 Facility	0	25	25	0	25	25
Untreated Flows Sent to Public Law 106-457 Facility	0	15	34	0	15	34
Treated Flows Discharged to SBOO from SBIWTP or Public Law 106-457 Facility (Advanced Primary or Secondary)	25	40	59	25	40	0
Tijuana Flows Sent by Mexico to SABWWTP	31	25	25	31	25	25
Flows Treated at SABWWTP via PCL	25	25	25	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25	25	65 (4)	84 (4)
Untreated Flows Discharged to Punta Bandera/Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	0	0	6	0	0
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) First year of Public Law 106-457 facility operations with 25 mgd treated effluent from SBIWTP and additional flows of raw wastewater from Tijuana
(3) Master Plan 20-year Planning Horizon/ Public Law 106-457 facility operations at 59 mgd
(4) Represents sum of treated effluent from Public Law 106-457 facility and SABWWTP
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel

The principal difference between the discharge options is the discharge location and volume of secondary treated effluent. Option I discharges up to 59 mgd of secondary treated effluent in the United States, and Option II discharges up to 84 mgd of secondary treated effluent to the shoreline at Punta Bandera.

Facilities for this alternative would be designed to ensure compliance with water quality standards of the United States and Mexico, and in accordance with NPDES permit limitations. Final design of the treatment facility would be subject to approval of both sections of the IBWC in accordance with Minute 311.

2.2.4.2 Alternative 4 Option B: Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico

Under Alternative 4 Option B, SBIWTP operation would cease. Up to 59 mgd of wastewater flows would be conveyed to the Public Law 106-457 facility for secondary treatment. Flows beyond 59 mgd generated by the City of Tijuana would be retained in Mexico and conveyed to the SABWWTP via the PCL for treatment.

This alternative would require new facilities in the United States and Mexico. The facilities required for this option would be similar to those identified for Option A, with two exceptions:

- There would be no pump station at the SBIWTP
- The Tijuana pump station would be sized to pump up to 59 mgd of raw sewage to the Public Law 106-457 treatment facility

In addition, the treatment process at the secondary treatment plant in Mexico would differ. With Option B, the treatment process would include preliminary treatment (screening and grit removal) as well as primary sedimentation of the raw wastewater before secondary treatment. Sludge digestion and handling would be provided for the primary and secondary sludge.

Existing and Projected Flows under Alternative 4 Option B

Untreated Flows Discharged in Mexico. Table 2.2.4-2 shows the existing and projected flows for Alternative 4 Option B with Discharge Options I and II.

Untreated flows discharged to the shoreline in Mexico were estimated at 6 mgd in 2004. However, these flows would cease when the Public Law 106-457 facility began operation in 2009. The principal difference between these discharge options is the discharge location and volume of secondary treated effluent projected for 2009 and 2023.

Facilities for this alternative would be designed to ensure compliance with water quality standards of the United States and Mexico, and in accordance with NPDES permit limitations. Final design of the treatment facility would be subject to approval of both sections of the IBWC in accordance with Minute 311.

Table 2.2.4-2. Existing and Projected Flows for Alternative 4: Public Law 106-457 Facility (Option B – All Flows Treated In Mexico) and Discharge Options I and II

Description	Average Day Flows (mgd)					
	2004 (1)		2009 (2)		2023 (3)	
Total Wastewater Flows in Tijuana	**56**		**65**		**84**	
	Discharge Option I			**Discharge Option II**		
Origin and Destiny of Wastewater	**2004**	**2009**	**2023**	**2004**	**2009**	**2023**
Flows Treated at SBIWTP (Advanced Primary)	25	0	0	25	0	0
Flows Sent to Public Law 106-457 Facility						
Treated Flows from SBIWTP Sent to Public Law 106-457 Facility	0	0	0	0	0	0
Untreated Flows Sent to Public Law 106-457 Facility	0	40	59	0	40	59
Treated Flows Discharged to SBOO from SBIWTP or Public Law 106-457 Facility (Advanced Primary or Secondary)	25	40	59	25	0	0
Tijuana Flows Sent by Mexico to SABWWTP	31	25	25	31	25	25
Flows Treated at SABWWTP via PCL	25	25	25	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25	25	65	84 (4)
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico ShoreLine)	6	0	0	6	0	0
Flows Discharged to Tijuana River by Mexico	0	0	0	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) First year of Public Law 106-457 facility operations with 25 mgd treated effluent from SBIWTP and additional flows of raw wastewater from Tijuana
(3) Master Plan 20-year Planning Horizon/ Public Law 106-457 facility operations at 59 mgd.
(4) Represents sum of treated effluent from Public Law 106-457 facility and SABWWTP.
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel

2.2.4.3 Alternative 4 Option C: Bajagua LLC, Proposal – Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

A private company, Bajagua Project LLC, has developed a proposal to construct and operate a treatment facility in Mexico. The location of facilities in Mexico is shown on Figure 2.2.4-1. In 1999, Bajagua Project LLC prepared a Final Environmental Information Document (EID) addressing its proposal (Bajagua LLC, 1999). In March 2004, Bajagua Project LLC updated its EID with updated environmental information and to reflect enactment of Public Law 106-457 and Minute 311 (R.W. Beck, 2004). Information from the 1999 EID and the 2004 updated EID is summarized in this Draft SEIS for analyzing Alternative 4 Option C (Bajagua LLC Project).

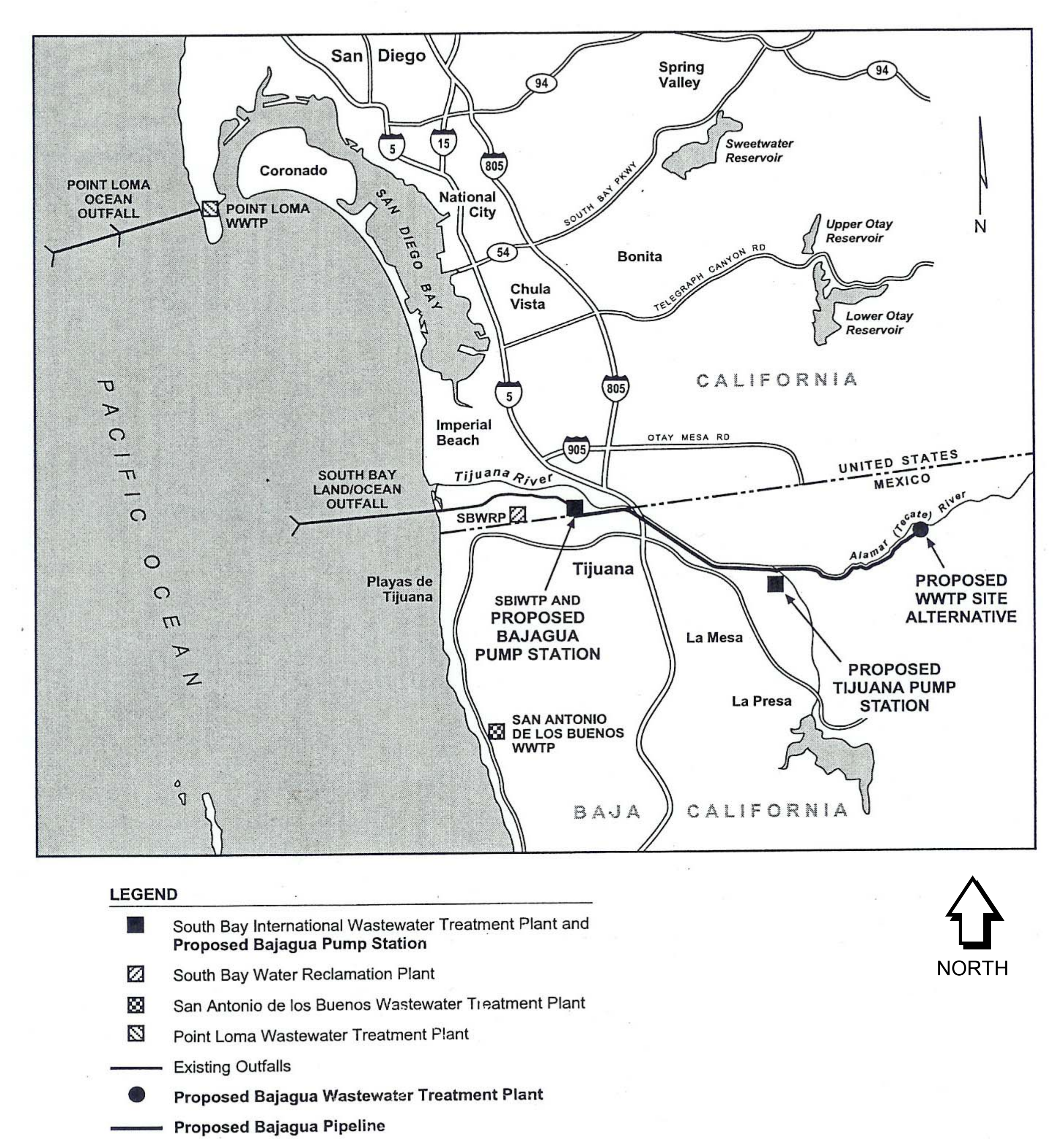


Figure 2.2.4-1. Regional Location of Alternative 4 Option C (Proposed Bajagua LLC Project)

For Alternative 4 Option C, SBIWTP operation as an advanced primary facility would continue, with 25 mgd of primary treated effluent sent to a secondary treatment facility to be constructed in Mexico (Bajagua Plant). All other flows would remain within Mexico, with 25 mgd being conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd of raw sewage would be pumped to the Public Law 106-457 treatment facility. This alternative would require new facilities in the United States and in Mexico as described below.

United States Facilities

United States facilities for Alternative 4 Option C would include a new pump station at the SBIWTP site as well as about 800 feet of the project's force main and return-flow pipeline. The pump station would be situated on the SBIWTP site, west of the primary sedimentation tanks and north of the southwest entrance to the plant (see Figure 2.2.4-2). The pump station would include a connection to the discharge piping from the existing SBIWTP. The pump station design would include an integral wet well sized for 1.5 million gallons for pump station operation and provide short-term storage during peak flow periods.

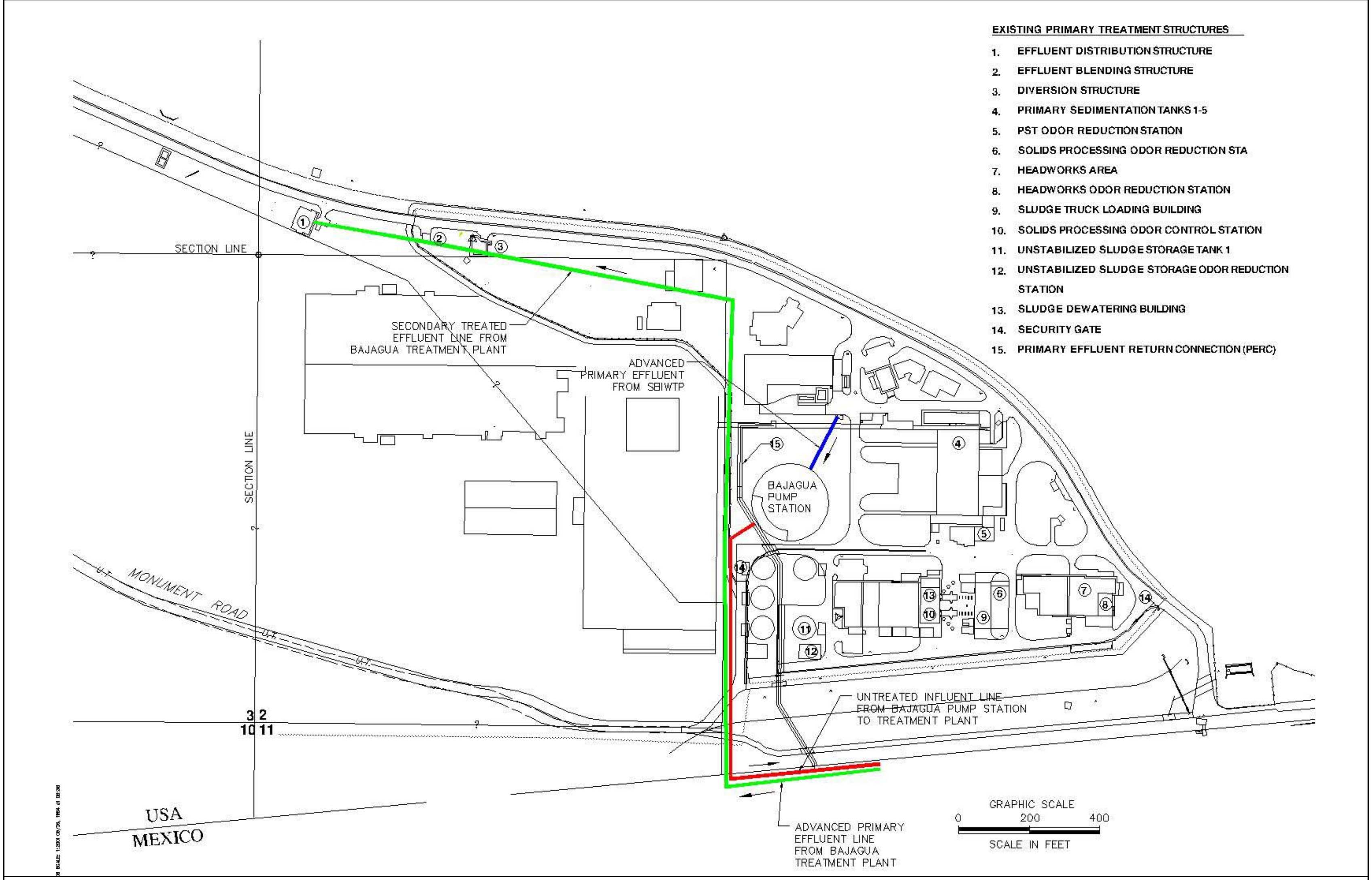
The force main would be 48 inches in diameter, sized to accommodate a peak flow of 40 mgd, and would extend from the discharge header at the Bajagua pump station directly south about 800 feet across the international border.

Mexico Facilities

Mexico facilities for Alternative 4 Option C would include: the force main for conveying primary-treated effluent to the treatment plant site, a pump station and force main for conveying raw wastewater from the Tijuana sewer system to the Bajagua WWTP site, the return pipeline conveying secondary-treated effluent back to the SBIWTP, and the Bajagua treatment facility. The force main and return flow pipeline would be located in the same corridor.

Treatment Plant Site

While the Final EID originally identified two alternative treatment plant sites, including the Tijuana River site and the Alamar River site, Bajagua Project LLC is now proposing to use the Alamar River site (R.W. Beck, 2004). The Alamar River site, which occupies about 233 acres, is about 12.5 miles from the SBIWTP near the eastern limit of Tijuana, just west of the Canyon del Padre (see Figure 2.2.4-2). The flat site is surrounded by steep hills to the north, south, and east. It contains alluvial soils with the ground water table about 15 to 20 feet below the ground surface and primarily supports agricultural uses. Figure 2.2.4-3 shows the proposed treatment plant site layout.



Source: R.W. Beck, 2004

Figure 2.2.4-2. Existing SBIWTP with Proposed Public Law 106-457 Pump Station

Source: R.W. Beck, 2004

Figure 2.2.4-3. Proposed Bajagua Treatment Plant Site Layout Alternative 4 Option C

SBIWTP Force Main

From the border, the 48-inch force main for conveying primary-treated effluent to the Public Law 106-457 treatment plant site would extend about 12.5 miles to the site. Figure 2.2.4-2 shows the proposed force main alignment. For the first 1.4 miles in Tijuana, the force main would be constructed in the shoulder of Avenida Internacional, which runs along the border. At that point, the route would turn southeast along the south bank of the Tijuana River. For the next 4.4 miles (7.1 km), the force main would be constructed in the gravel road along the top of the berm next to the flood protection channel or at the outside toe of the berm. The channel is lined with reinforced concrete to the level of the 500-year flood. At the confluence of the Tijuana and Alamar rivers, the force main would cross under the Tijuana River and continue east along the south bank of the Alamar River about 6 miles to the Public Law 106-457 plant site.

Tijuana Force Main

The force main from the Tijuana pump station to the Public Law 106-457 treatment plant site would be about 6.5 miles long. The main would cross under the Tijuana River and then follow the pipelines joining the Bajagua treatment plant with the SBIWTP east along the south bank of the Alamar River to the Bajagua treatment plant site. The pipeline would be a 48- or 54-inch cement mortar lined steel pipe, depending on the pump station design capacity.

Return Flow Pipeline

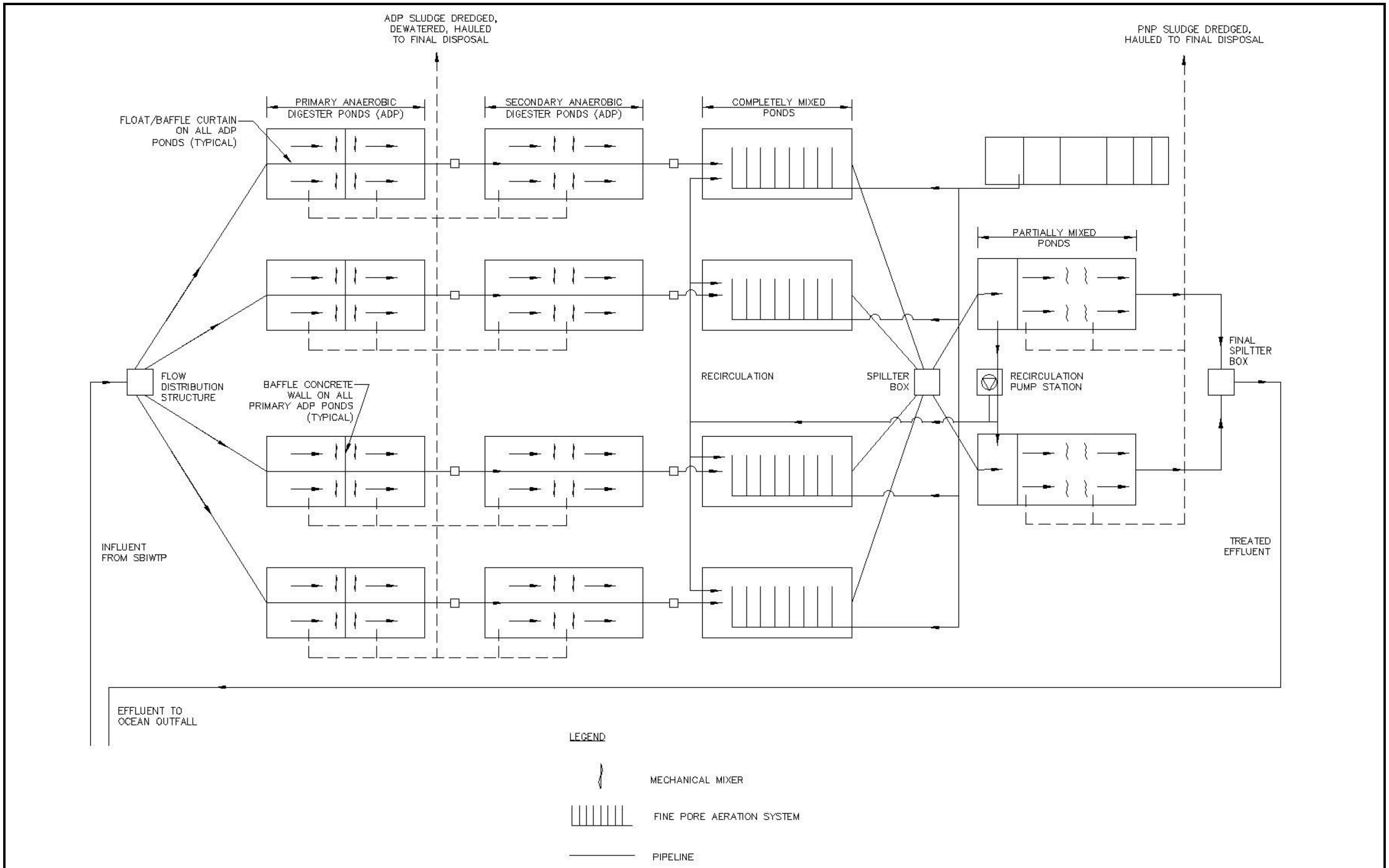
The return flow pipeline would transport secondary treated effluent to the SBOO. The pipeline would be a 36-inch diameter reinforced concrete pipe and, upon leaving the Bajagua treatment plant site, would follow the same alignment as the force main to the United States border. After crossing the border, the return flow pipeline would run north and then northwest for about 1,400 feet through the SBIWTP site, where it would connect with the SBOO at the existing effluent blending structure. The return flow pipeline would be designed for gravity flow.

Tijuana Raw Wastewater Pump Station

The Tijuana Raw Wastewater Pump Station would be used to pump raw wastewater from the main Tijuana collector that parallels the Tijuana River to the Bajagua treatment plant site. It would be situated just south of the Tijuana River near its confluence with the Alamar River and adjacent to the main sewer collector in the Tijuana Sewer System. The Tijuana Raw Sewage Pump Station would have the capacity to deliver an average flow of 25 or 50 mgd of raw sewage to the treatment plant, with a peaking factor of 1.5.

Secondary Treatment Process

Alternative 4 Option C would provide secondary treatment using a completely mixed aerated (CMA) pond system. Figure 2.2.4-4 is a process flow schematic for this alternative.



Source: Bajagua LLC, 1999

Figure 2.2.4-4. Operational Schematic of Alternative 4 Option C Bajagua Treatment Plant

All wastewater delivered to the Bajagua treatment plant would enter near the site's eastern boundary to facilitate gravity flow through the treatment process. Advanced primary effluent from the SBIWTP would discharge directly to a splitter box and be distributed to the aeration basins. Raw sewage from Tijuana would discharge to headworks consisting of screening and grit removal before entering the aeration basins. Treatment plant piping would provide flexibility to allow the advanced primary effluent to be treated separately or to be blended with the raw sewage.

Secondary treatment includes the aeration lagoons and clarifiers, followed by disinfection before discharge of the treated effluent. Sludge would settle and be removed from the clarifiers. It would be thickened using a dissolved air flotation (DAF) process followed by dewatering using belt filter presses.

The treatment plant site slopes from south to north toward the Alamar River and from east to west along the river's course. The wastewater would be delivered to the higher ground along the south side of the lagoons and flow north through the lagoons toward the river. The clarifiers and sludge wasting/recycling tank would be north of the lagoons near the river as would be the effluent return pipeline to the SBIWTP. The sludge dewatering facilities and plant support structures will be situated in the northeast sector of the property.

Bajagua Project LLC has modified the plant layout and treatment process since the original concept, which provided secondary treatment for 25 mgd of advanced primary effluent from the SBIWTP. The size and layout of the site was increased to provide secondary treatment of up to 75 mgd of peak flows, compared with the original 25 mgd plant. Plant capacity will be 59 mgd, in compliance with Minute 311 (R.W. Beck, 2004).

Alternative 4 Option C would be an extended aeration plant without primary sedimentation or sludge disinfection. The facility would utilize grit removal, lined earthen aeration basins with floating aerators, concrete secondary clarifiers and belt filter presses. The treatment process no longer includes the anaerobic digester ponds in the original design. Those ponds have been configured to operate in an extended aeration activated sludge mode. The partially mixed ponds in the original design have been replaced with the clarifiers. Solids would settle in the clarifiers, and the sludge would be removed continuously and recycled to the aerated ponds. Excess sludge would be withdrawn from the clarifiers, thickened and dewatered, and hauled to disposal.

The proposed new facilities would be designed to treat an average monthly organic loading of 325 mg/L BOD_5 and 325 mg/L TSS, and an average flow of 50 mgd with a 75 mgd peak. The system would be designed to meet existing NPDES permit limits. Table 2.2.4-3 shows proposed design criteria for the Bajagua plant.

Existing and Projected Flows under Alternative 4 Option C

Untreated Flows Discharged in Mexico. Table 2.2.4-1 shows the existing and projected flows for Alternative 4 Option C with Discharge Options I and II. The volume of untreated flows discharged to the shoreline in Mexico would be the same as for Alternative 4 Option A (see Subchapter 2.2.4-1).

The principal difference between the discharge options is the discharge location and volume of secondary treated effluent projected for 2009 and 2023.

Table 2.2.4-3. Design Criteria for the Bajagua Project

Design Flows and Organic Loadings		
	Flows (avg/peak)	50/75 mgd
	BOD	325 mg/L
	TSS	300 mg/L
	Flows (avg/peak)	25/40 mgd
	BOD	139 mg/L
	TSS	150 mg/L
Description of Unit Treatment Processes		
Bar Screens	Number	3 duty/1 standby/1 bypass
	Type	Mechanically cleaned
	Capacity (each)	50 mgd
	Area	2,000 m^2
Grit Removal Tanks	Number	8
	Type	Aerated Tank
	Area (each)	25 m^2
Scrubber	Number	2
	Type	Dual Stage
	Chemicals	Acid, caustic, hypochlorite
	Target Pollutants	H22, mercaptans, amines, ammonia, aldehydes, ketones, VOCs
Aeration Basin	Number	12
	Type	Earth with liner
	Volume (each)	10 mg
	miss	2,500 mg/1
	BOD Loading	0.08 lb BOD/lb mlvss
	Mixing	Fixed mechanical aerators
	Horsepower	125 hp each, 84 units
Clarifiers	Number	12
	Volume (each)	1.0 mg
	Detention (average)	3.8 hours
	Hydraulic loading	500 gpd/ft^2
	Area (total)	20,000 m^2
Sludge Handling Facilities		
Sludge Thickening	Type	Dissolved Air Flotation Tanks
	Number	4 (3 duty, 1 standby)
	Diameter	17m
	Flow	2,500 gpm
	Hydraulic Loading	500 gpd/ft^2
	Area (total)	20,000 m^2

Table 2.2.4-3. Design Criteria for the Bajagua Project (Cont'd)

Sludge Handling Facilities (Contd)		
Sludge Watering	Type	Belt Presses
	Number	7 (6 duty, 1 standby)
	Capacity (each)	150 gpm
	Solids, Feed Sludge	4%
	Solids, Processed Sludge	18%
Disinfection	Type	Sodium Hypochlorite
	Dosage	5 mg/L
	Quantity	3,100 pounds per day at 75 mgd
	Chemical Pumps	3 (2 duty, 1 standby)
	Storage	Bulk Tanks
	Injection Points	Headworks, Effluent
Electricity Supply	Service	8MW, 12 kV
	Substation	12 kV to 480V
	Standby power	3-2 MW Diesel Generators
Source: R.W. Beck, 2004		

Facilities for this alternative would be designed to ensure compliance with water quality standards of the United States and Mexico, and in accordance with NPDES permit limitations.

2.2.5 Alternative 5: Secondary Treatment in the United States at SBIWTP

Under Alternative 5, secondary treatment facilities (activated sludge or CMA ponds) would be constructed at the SBIWTP to treat 25 mgd of wastewater with disposal to the SBOO. This alternative would require Mexico to treat all flows beyond the capacity of the SBIWTP. Within Mexico, flows would be conveyed to the SABWWTP (25 mgd capacity) via the PCL and would be discharged at Punta Bandera. Any remaining flows would be discharged untreated at Punta Bandera.

The alternative of constructing secondary treatment facilities in the United States was analyzed in prior NEPA documents for the SBIWTP. The 1994 Final EIS identified activated sludge facilities as the preferred alternative and this treatment option was approved in the 1994 ROD. This NEPA evaluation was later supplemented by the 1999 Final SEIS, which evaluated treatment options for providing secondary treatment at the SBIWTP. Options evaluated in the 1999 EIS included a CMA pond system at the former Hofer site as well as the following two options for an activated sludge treatment process at the SBIWTP:

- Activated Sludge with Flow Equalization Basins (FEB), Option B-1
- Activated Sludge with Expanded Capacity, Option B-2

These alternative treatment options are evaluated in this Draft SEIS to provide secondary treatment in the United States at the SBIWTP. The CMA pond system at the former Hofer site is referred to as Alternative 5 Option A. The activated sludge options, with flow equalization basins and with expanded capacity are referred to as Alternative 5 Options B-1 and Option B-2, respectively. Due to lack of adequate funding, secondary facilities in the United States have not been constructed.

The following descriptions are summarized from the 1999 Final SEIS (CH2M Hill, 1999).

2.2.5.1 Alternative 5 Option A: Completely Mixed Aeration (CMA) Ponds at SBIWTP

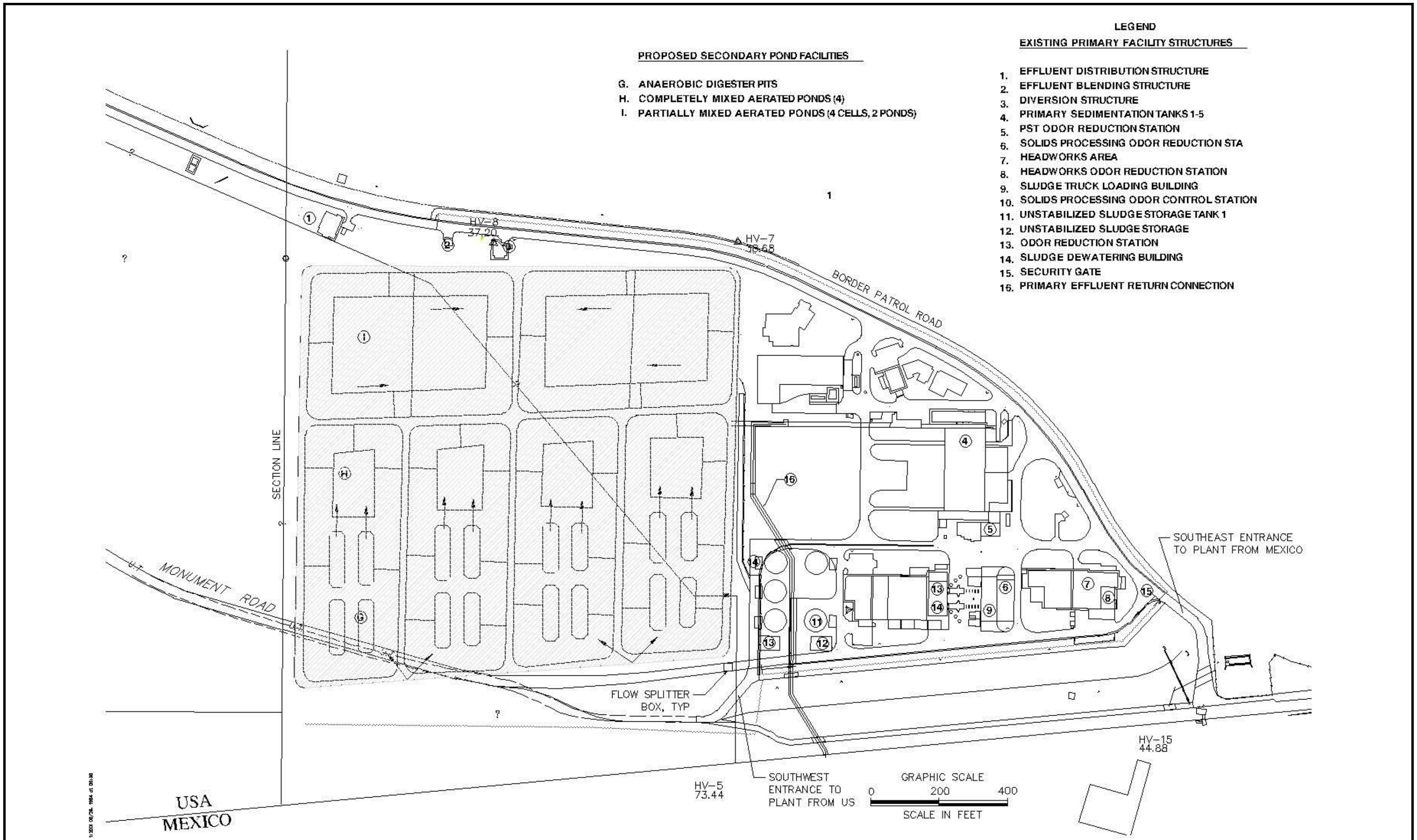
In the 1999 ROD for the Long Term Treatment Options Final SEIS, the EPA, and the USIBWC selected the CMA pond system at the former Hofer site as the long-term option to provide secondary treatment of 25 mgd of wastewater at the SBIWTP (see Subchapter 1.2.3). The following description is summarized from the 1999 Final SEIS (CH2M Hill, 1999).

In 1996, a Phase I Ponds Study (Boyle Engineering, 1996a) was prepared as a preliminary feasibility study of pond treatment systems for secondary treatment at the SBIWTP. Seventeen pond-based wastewater treatment systems in the southwestern United States were studied for performance and to evaluate the use of pond treatment systems for secondary treatment. The study concluded that both an advanced integrated pond system (AIPS) and a CMA pond system would perform to specified standards and that AIPS was preferred because of its smaller aeration requirements. Two sites were evaluated and recommended for follow-up study: the former Hofer site and the Spooner's Mesa site.

In 1997, a Phase II Ponds Study (CH2M Hill, 1997) was conducted to evaluate the performance of AIPS types I and II and the CMA pond system at the former Hofer and Spooner's Mesa sites. The study found that both sites could be used for pond treatment systems that would meet specified treatment levels. The CMA system was selected for the former Hofer site, and later modified as recommended by the Phase II Ponds Study to include certain AIPS features (CH2M Hill, 1999). The AIPS type II was selected for the Spooner's Mesa site.

As evaluated in the 1999 FEIS and ROD, this alternative includes a treatment pond option capable of treating 25 mgd average flow with peaks of 50 mgd adjacent to the advanced primary treatment facilities at the SBIWTP. This alternative assumes that conventional primary treatment, rather than advanced primary treatment, is provided at the SBIWTP to fully optimize the pond system (CH2M Hill, 1998b). The primary effluent would be the influent to the pond systems. The wastewater would be treated in the pond system to a secondary or secondary-equivalent level. Figure 2.2.5-1 shows the physical layout of this system and Figure 2.2.5-2 shows an operational schematic of the physical facilities required for the CMA ponds. The CMA process used in this alternative would be preceded by treating the effluent in specialized cells called anaerobic digester pits (ADP). This design incorporates recommended modifications to this alternative per the Phase II Ponds Study, including the addition of ADP to the CMA treatment train before the CMA ponds. The new facilities required for this alternative include these major elements:

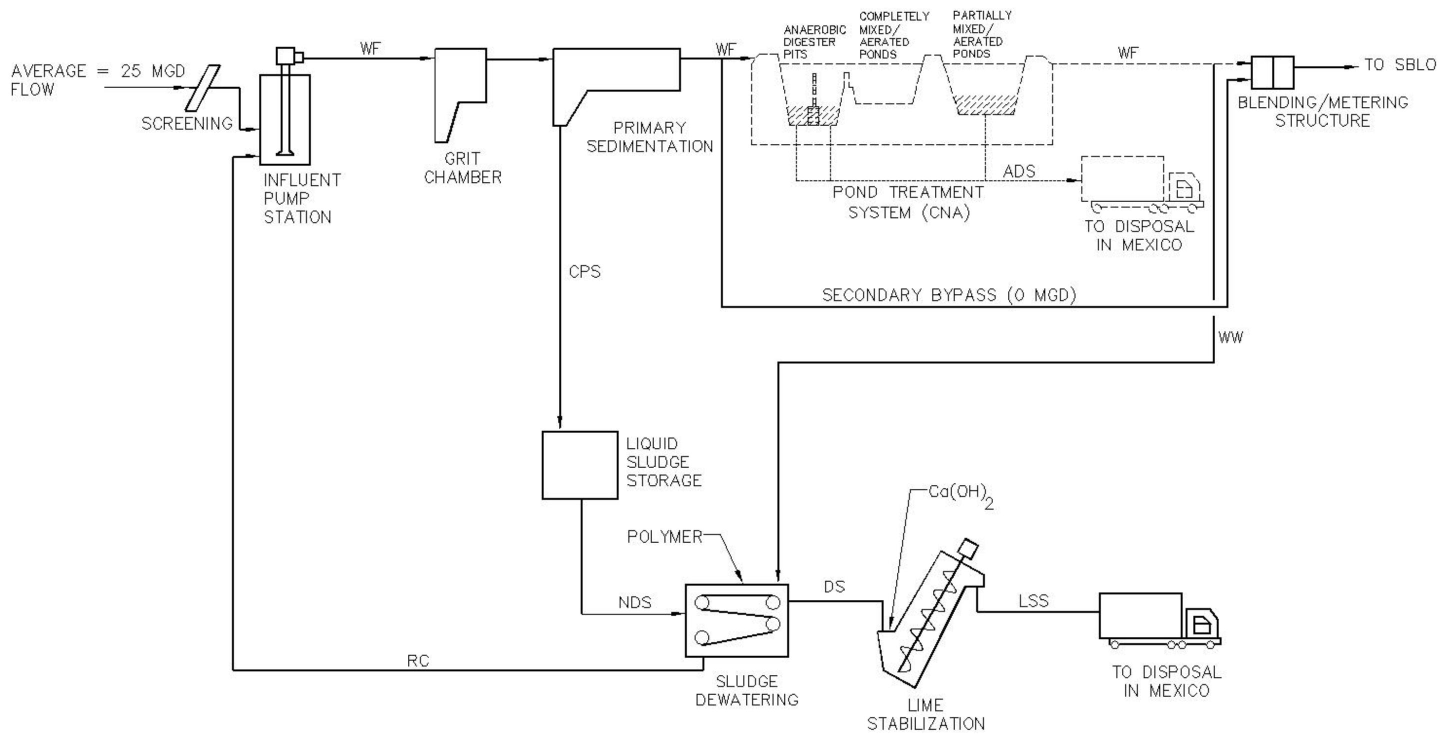
- Four ponds having a total volume of 147 million gallons, each divided into five cells: four ADPs receiving primary effluent followed by one CMA cell, which receives effluent from all of the ADPs. The ADPs would have surface aerators and the CMA cells would be completely mixed and aerated.



Source: CH2M Hill, 1999

NORTH

Figure 2.2.5-1. Physical Features of Alternative 5 Option A - Completely Mixed Aerated Pond System



<u>LOADINGS</u>

BOD_5 = 370 mg/L
TSS = 350 mg/L

<u>PRIMARY TREATMENT REMOVALS</u>

BOD_5 = 45%
TSS = 75%

<u>FLOW STREAM</u>

APS = ADVANCE PRIMARY SLUDGE
$Ca(OH)_2$ = CALCIUM CARBONATE
DS = DEWATERED SLUDGE
LSS = LIME STABILIZED SLUDGE

NDS = NONDEWATERED SLUDGE
RC = RECYCLED WATER
WW = WASTEWATER
WF = TREATED WASTEWATER FLOW

——— EXISTING SBIWTP FACILITIES
------- PROPOSED SBIWTP FACILITIES
.... CMA SYSTEM SLUDGE DISPOSAL

SBIWTP = SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT
SBLO = SOUTH BAY LAND OUTFALL

Source: CH2M Hill, 1999

Figure 2.2.5-2. Operational Schematic of Alternative 5 Option A Completely Mixed Aerated Pond System

- Two surface aerated ponds (27 million gallons each) divided into two cells, each pond receiving effluent from the CMA cells.
- Distribution structures, pump stations and a new control building.

This alternative would cover about 36 acres of land and have a total pond surface area of about 29 acres. The proposed new facilities would be sized to treat an average monthly organic loading of 370 mg/L BOD_5 and 350 mg/L TSS, and an average flow of 25 mgd with a 50 mgd peak. The system would be designed to provide a secondary effluent quality of about 20 mg/L BOD_5 and 20 mg/L TSS with a total system capacity of about 126 million gallons.

Existing and Projected Flows Under Alternative 5 Option A

Untreated Flows Discharged in Mexico. Table 2.2.5-1 shows the projected flows for Alternative 5 Option A. The untreated flow volumes discharged to the shoreline in Mexico would be the same as for the No Action Alternative, Option B (Alternative 1 Option B).

Table 2.2.5-1. Existing and Projected Flows for Alternative 5 - Secondary Treatment in the United States (CMA Ponds or Activated Sludge), Options A, B-1 and B-2

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary/Secondary)	25	25	25
Treated Flows Discharged to SBOO (Advanced Primary/Secondary)	25	25	25
Tijuana Flows Sent by Mexico to SABWWTP	31	40	59
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	15	34
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) Five Year Planning Period/Secondary Treatment Assumed to commence by 2009
(3) Master Plan 20-year Planning Horizon
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel
Source: Parsons (September 2004)

2.2.5.2 Alternative 5 Option B: Activated Sludge Secondary Treatment

Alternative 5 Options B-1 and B-2 would provide secondary treatment at the SBIWTP in the United States using activated sludge treatment.[1]

Activated Sludge with Flow Equalization Basin (Alternative 5 Option B-1)

For the Activated Sludge with Flow Equalization Basin Alternative (Alternative 5 Option B-1), activated sludge secondary treatment facilities would be constructed at the existing SBIWP site. This alternative would result in an average flow of 25 mgd into the SBIWTP with flow equalization basins to accommodate peak flow storage and subsequent off-peak discharge to the secondary activated sludge facility. Flow equalization basins capable of storing peak flows greater than 25 mgd would be constructed for this alternative. A storage volume of 7 million gallons would be required. Accordingly, the average flow through both the advanced primary and secondary portion of the plant would be 25 mgd. Flow through the primary portion of the plant would follow the daily flow variations with a low flow of about 3.5 mgd and a peak flow of 50 mgd. Before this variable flow enters the secondary portion, it would be equalized by the basins to a steady rate of 25 mgd.

The flow equalization basins would be situated within the existing SBIWTP footprint (see Figure 2.2.5-3). Figure 2.2.5-4 shows an operational schematic of the facilities required for this alternative. The proposed new facilities would include these major elements:

- One 7-million gallon equalization basin and a pump station capable of pumping up to 21.50 mgd to the activated sludge process.
- Six single-pass conventional activated sludge tanks with fine bubble diffusers and anoxic zone selectors, including one aeration blower structure with three blowers.
- Eight secondary sedimentation tanks with return-activated sludge pump facilities, a secondary skimming pump station, and an electrical local control center.
- Two 27-foot-diameter dissolved air flotation thickeners with chemical addition facilities.
- One 34-foot-diameter sludge storage tank.
- Extension of the support facilities such as yard piping to accommodate the expanded site and facilities for the secondary treatment facilities.

These proposed new activated sludge and related facilities are sized to treat a monthly average organic loading of 370 mg/L BOD_5 and 350 mg/L TSS, and an average flow of 25 mgd plus in-plant recycle flows from the sludge dewatering activities. The equalization basin facility is designed to equalize peak flows of up to 50 mgd. The flows to the activated sludge facility would be equalized to a 25 mgd constant flow. The activated sludge facility is designed to provide an effluent quality of about 19 mg/L BOD_5 and 19 mg/L TSS.

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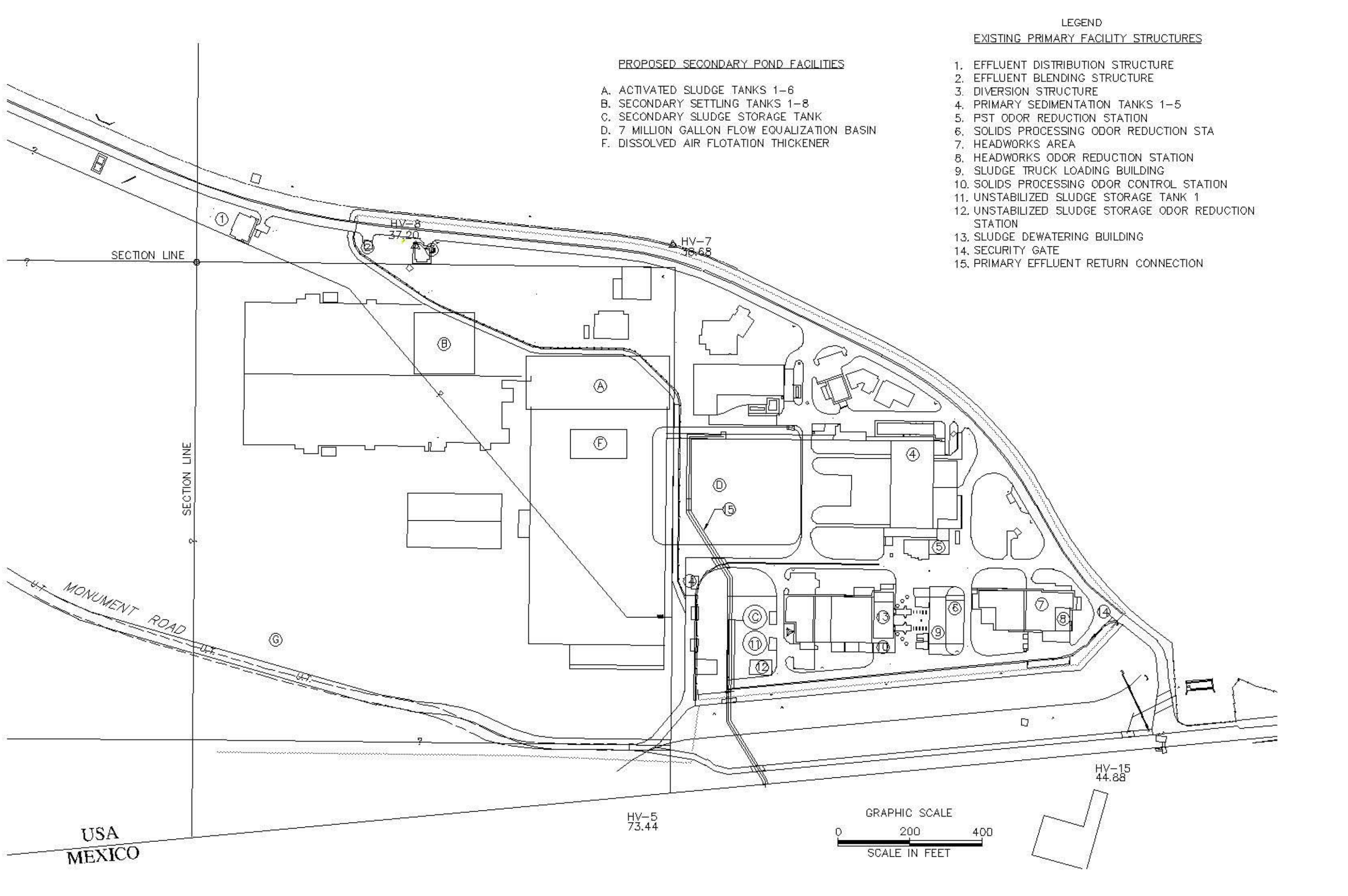
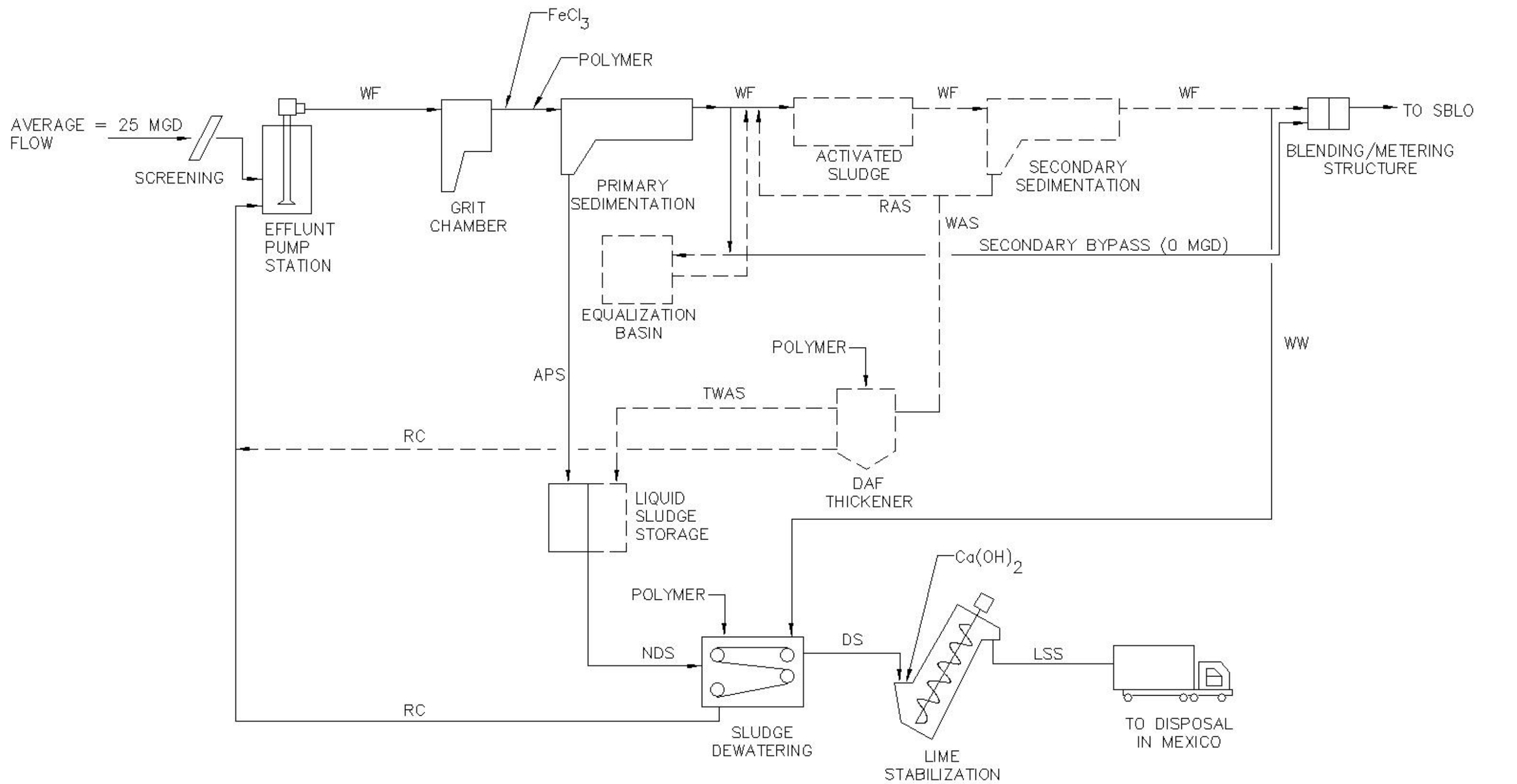
[1] Although this alternative was previously evaluated but not selected, it is being evaluated and reconsidered at this time in order to provide updated information and because it is a feasible alternative.



Source: CH2M Hill, 1998

NORTH

Figure 2.2.5-3. Physical Features of Alternative 5 Option B-1 (Activated Sludge with Flow Equalization)



LOADINGS

BOD_5 = 370 mg/L
TSS = 350 mg/L

PRIMARY TREATMENT REMOVAL

BOD_5 = 45%
TSS = 75%

——————— EXISTING SBIWTP FACILITIES

– – – – – – – – PROPOSED SBIWTP FACILITIES

FLOWSTREAM

APS = ADVANCE PRIMARY SLUDGE
$Ca(OH)_2$ = CALCIUM CARBONATE
DS = DEWATERED SLUDGE
$FeCl_3$ = FERRIC CHLORIDE
LSS = LIME STABILIZED SLUDGE
NDS = NONDEWATERED SLUDGE
RAS = RETURN ACTIVATED SLUDGE
SBLO = SOUTH BAY LAND OUTFALL
RC = RECYCLED WASTEWATER
TWAS = THICKENED WASTE ACTIVATED SLUDGE
WAS = WASTE ACTIA
WF = TREATED WAS
WW = WASTEWATER

Source: CH2M Hill, 1998

Figure 2.2.5-4. Operational Schematic of Alternative 5 Option B-1 (Activated Sludge with Flow Equalization)

Existing and Projected Flows under Alternative 5 Option B-1

Untreated Flows Discharged in Mexico. Under Alternative 5 Option B-1 (Activated Sludge), the untreated flow volumes discharged to the shoreline in Mexico would be the same as for Alternative 5 Option A (CMA Ponds), because the secondary treatment provided at the SBIWTP site would not affect the volume of untreated flows discharged.

Activated Sludge with Expanded Capacity (Alternative 5 Option B-2)

Under the Activated Sludge with Expanded Capacity Alternative (Alternative 5 Option B-2), activated sludge secondary treatment facilities would be constructed on the existing SBIWTP property and at the 40-acre former Hofer site as described in the 1999 Final EIS. This alternative would use activated sludge as the secondary treatment process and the capacity of the facilities would be expanded to accommodate peak flows.

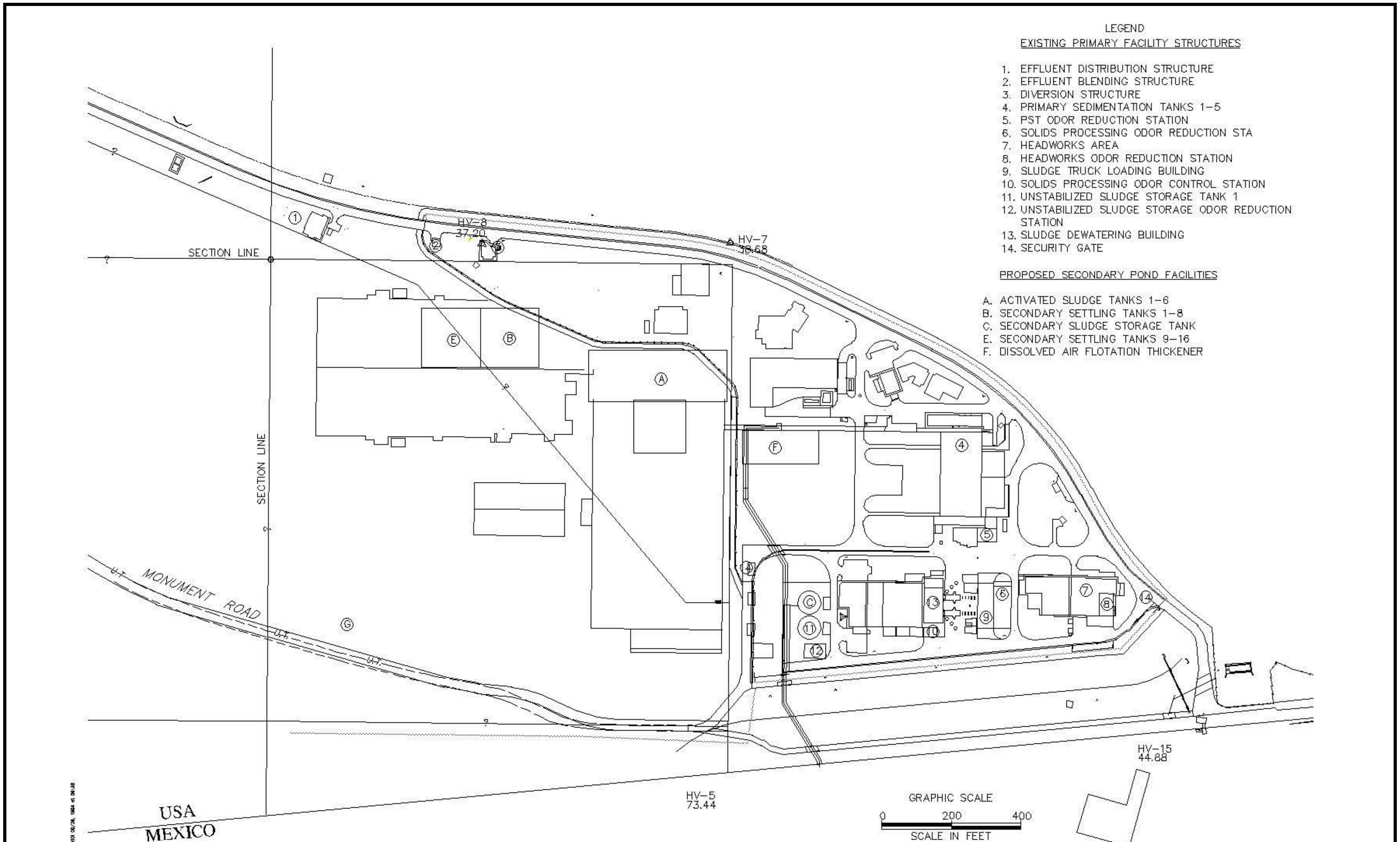
For this alternative, an average flow of 25 mgd with peak flows up to 50 mgd would be treated by the advanced primary and the secondary facilities. The proposed new facilities, which would be located on the current SBIWTP property (see Figure 2.2.5-5), would include these major elements:

- Six single-pass conventional activated sludge tanks with fine bubble diffusers and anoxic zone selectors, including one aeration blower structure with four blowers.
- Sixteen secondary sedimentation tanks with return-activated sludge pump facilities, a secondary skimming pump station, and an electrical local control center.
- Two 27-foot-diameter dissolved air flotation thickeners with chemical addition facilities.
- One 34-foot-diameter sludge storage tank.
- Extension of the support facilities such as yard piping to accommodate the expanded site and facilities for the secondary treatment facilities.

Figure 2.2.5-6 shows an operational schematic of the facilities required for the SBIWTP with activated sludge with expanded capacity. These proposed activated sludge and related facilities would be sized to treat an average monthly organic loading of 370 mg/L BOD_5, 350 mg/L TSS, and an average flow of 25 mgd plus in-plant recycle flows from the sludge dewatering. The facilities would be designed to treat peak flows of 50 mgd. The activated sludge facilities would be designed to provide an effluent quality of about 19 mg/L BOD_5 and 19 mg/L TSS.

Existing and Projected Flows under Alternative 5 Option B-2

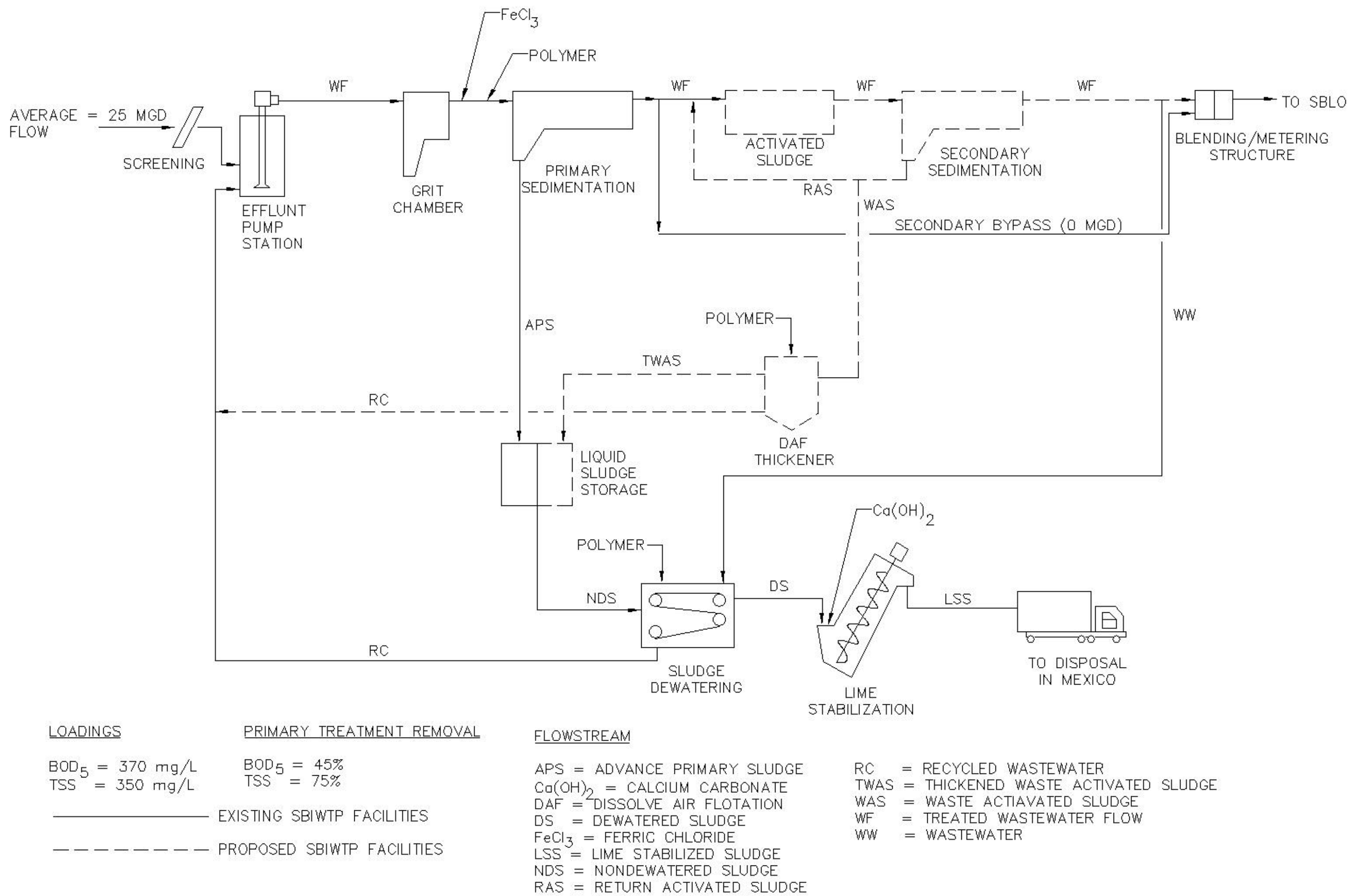
Untreated Flows Discharged in Mexico. As discussed earlier, the untreated flow volumes discharged to the shoreline in Mexico under Alternative 5 Option B-2 would be the same as for Alternatives 1 Option B, 5 Option A (CMA Ponds) and 5 Option B-1 (see Table 2.2.5-1).



Source: CH2M Hill, 1999

NORTH

Figure 2.2.5-5. Physical Features of Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity)



Source: CH2M Hill, 1998

Figure 2.2.5-6. Operational Schematic of Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity): System Operations

2.2.6 Alternative 6: Secondary Treatment in the United States and in Mexico

Alternative 6 is a combination of the treatment processes described for Alternatives 4 and 5, with the secondary treatment facilities being provided at the SBIWTP in the United States and in Mexico. Under Alternative 6, the secondary treatment facilities provided at the SBIWTP (activated sludge or CMA ponds) would treat 25 mgd of wastewater with disposal to the SBOO. Flows beyond the SBIWTP capacity would be treated in Mexico at the SABWWTP (25 mgd) (conveyed via the PCL or the OCC) with discharge to Punta Bandera and at a new Public Law 106-457 facility with disposal to the SBOO. Detailed descriptions of the facilities required for this alternative appear in Subchapters 2.2.4 and 2.2.5 of this Draft SEIS.

Existing and Projected Flows Under Alternative 6

Untreated Flows Discharged in Mexico. Table 2.2.6-1 gives the existing and projected flows for Alternative 6. As Table 2.2.6-1 shows, untreated flows discharged to the shoreline are projected to be 6 mgd in 2004. However, untreated flows would be virtually eliminated once the Public Law 106-457 facility begins operation in 2009.

2.2.7 Alternative 7: SBIWTP Closure/Shutdown

This alternative, which would be necessary if the SBIWTP could not otherwise achieve compliance with the federal CWA through other means, assumes that the SBIWTP would be closed if CWA compliance cannot be achieved. It also assumes implementation of the following projects in Mexico:

- Tijuana Sewer Rehabilitation Project, certified by BECC in 2001, which includes 429,034 feet of sewer lines, laterals, collectors, subcollectors, and interceptors. Some of theses projects are already under construction.
- Rehabilitation and expansion of the San Antonio de los Buenos Plant, from 17 to 25 mgd. The renovation work was completed in early 2004.
- Construction of the four Japanese Credit Program wastewater treatment plants listed below. All are scheduled to begin operating in 2005.
  - La Morita (8.7 mgd)
  - Tecolote-La Gloria (8.7 mgd)
  - Monte de los Olivos (10.5 mgd)
  - Lomas de Rosarito (4.8 mgd)
- Renovation and rehabilitation of the original conveyance channel.

In addition, this alternative assumes that Mexico would construct the improvements identified under the “preferred option” in the *Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito*. The improvements to wastewater collection, pumping, and treatment consist of constructing five new wastewater treatment plants (including the four Japanese Credit Program plants and a regional wastewater treatment plant in the Alamar River area) and expanding two existing plants. Related infrastructure to support these improvements would include new pumping facilities and new pipelines.

Table 2.2.6-1. Existing and Projected Flows for Alternative 6: Secondary Treatment in United States (at SBIWTP) and in Mexico (at Public Law 106-457 Facility)

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary/Secondary)	25	25	25
Flows Sent to Public Law 106-457 Facility			
Treated Flows Sent to Public Law 106-457 Facility	0	0	0
Untreated Flows Sent to Public Law 106-457 Facility	0	15	34
Treated Flows Discharged to SBOO (Advanced Primary/Secondary) (4)	25	40	59
Tijuana Flows Sent by Mexico to SABWWTP	31	25	25
Flows Treated at SABWWTP via PCL	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL (Treated Flows Discharged to Mexico Shoreline)	25	25	25
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	6	0	0
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Existing conditions (first year of expanded SABWWTP)
(2) First year of Public Law 106-457 facility operations with raw wastewater flows from Tijuana River area
(3) Master Plan 20-year Planning Horizon/Public Law 106-457 facility operations at 59 mgd
(4) Represents the sum of discharges to SBOO from SBIWTP and Public Law 106-457 facility
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel
Source: Parsons (September 2004)

Existing and Projected Flows Under Alternative 7

Untreated Flows Discharged in Mexico. Table 2.2.7-1 gives the existing and projected flows for Alternative 7. With the shutdown/closure alternative, untreated flows would continue to be discharged to the shoreline in Mexico south of the San Antonio de los Buenos treatment works. As Table 2.2.7-1 shows, untreated flows discharged to the shoreline are projected to be 31 mgd in 2004. This volume would increase to 40 mgd by 2009 and to 59 mgd by 2023.

Table 2.2.7-1. Existing and Projected Flows for Alternative 7 SBIWTP Shutdown/Closure

Description	Average Day Flows (mgd)		
	2004 (1)	2009	2023 (2)
Total Wastewater Flows in Tijuana	56	65	84
Origin and Destiny of Wastewater			
Flows Treated at SBIWTP (Advanced Primary)	0	0	0
Treated Flows Discharged to SBOO (Advanced Primary)	0	0	0
Tijuana Flows Sent by Mexico to SABWWTP	56	65	84
Flows Treated at SABWWTP via PCL or OCC	25	25	25
Treated Flows Discharged to Punta Bandera from SABWWTP via PCL or OCC (Treated Flows Discharged to Mexico Shoreline)	25	25	25
Untreated Flows Discharged to Punta Bandera/ Bypassed at SABWWTP via OCC (Untreated Flows Discharged to Mexico Shoreline)	31	40	59
Flows Discharged to Tijuana River by Mexico (Untreated Flows Discharged to Tijuana River)	0	0	0

Notes:
(1) Assumes that SBIWTP ceases operation in 2004
(2) Master Plan 20-year Planning Horizon
PCL = Parallel Conveyance Line
OCC = Original Conveyance Channel
Source: Parsons (September 2004)

2.3 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The following alternatives were initially considered by the USIBWC but were determined to be infeasible for technical or other reasons. Each alternative and the reasons for its infeasibility are briefly described below.

2.3.1 Operate SBIWTP with Treated Flows Returned to Mexico for Discharge to Pacific Ocean South of Punta Bandera

The USIBWC considered operating the SBIWTP with treated flows returned to Mexico for discharge to the Pacific Ocean south of Punta Bandera. Under this alternative, the SBIWTP would continue to operate as an advanced primary facility. Once treated, the effluent would be sent to Tijuana via the SBIWTP's PERC facilities and Tijuana's old conveyance/pumping facilities. The treated effluent would then bypass treatment at the SABWWTP and be discharged into the ocean at a new point south of Punta Bandera. Because the coastal area south of Punta Bandera is developed with residential, commercial, and/or resort uses, a suitable location for the new discharge point that would not affect surrounding uses does not exist. Therefore, this alternative was eliminated from further consideration.

2.3.2 Operate SBIWTP with Treated Flows Sent to Mexico and SBWRP

Under this alternative, the SBIWTP would continue to operate as an advanced primary facility and send 15 mgd of advanced primary treated effluent or screened wastewater to the SBWRP for secondary treatment. However, instead of sending screened effluent to the Point Loma Wastewater Treatment Plant, 10 mgd of primary treated effluent would be returned to Mexico.

The facilities required to convey advanced primary treated effluent or screened wastewater to the SBWRP would be the same as those identified in Subchapter 2.2.3. The SBIWTP's primary effluent return connection and Mexico's PCL would be used to return treated effluent to Mexico.

Treated effluent from the SBWRP would be discharged to the SBOO. The treated effluent returned to Mexico, if it does not enter the SABWWTP, would be discharged to the surf at Punta Bandera.

Because the SBWRP has insufficient capacity to treat 15 mgd of wastewater, this alternative was eliminated from further consideration. In addition, the Rules, Finance and Intergovernmental Relations Committee of the San Diego City Council voted unanimously in 2002 to deny any request from the USIBWC to treat effluent from the SBIWTP at the SBWRP and/or the PLWTP because of toxicity of Tijuana wastewater, handling of sludge, reduced capacity, and reclaimed water concerns (City of San Diego, 2003c).

2.3.3 Other Alternatives

A variety of other alternative treatment processes and new technologies were identified or proposed as potential solutions to the SBIWTP operation. Nine treatment processes or technologies were raised during the public scoping meeting in November 2003. The USIBWC evaluated each alternative technology against feasibility and environmental factors. The reasons for eliminating these other alternatives from further consideration are shown in Table 2.3-1.

Many of the treatment technologies considered do not take into consideration the specific characteristics of effluent coming from Mexico which exhibits acute toxicity and other toxic substances. The USIBWC has decided to consider implementation of mechanical treatment processes over natural treatment processes which requires more time, a larger land area, and are less capable of timely recovery from a toxic load. Natural processes can typically lead to more problems with vectors and odor. It is also important to keep in mind that, in accordance with all Minutes, Mexico considers their wastewater and sludge as their own commodity that should be returned to Mexico for beneficial uses and/or reuse (i.e., sludge).

2.4 RELATED PROJECTS

A cumulative impact, as defined by the Council on Environmental Quality (40 CFR 1508.7), is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

Table 2.3-1. Rationale for Eliminating Other Alternatives from Further Consideration

Alternative	Definition	Rationale for Eliminating this from Further Consideration
Aerated Lagoons	Aerated pond/lagoon is an aerobic process very similar to activated sludge. Mechanical aerators are generally used to either inject air into the wastewater or to cause violent agitation of the wastewater and air in order to achieve oxygen transfer to the wastewater. As in activated sludge, the bacteria grow while suspended in the wastewater. Naturally aerobic (with oxygen) lagoons are designed to be shallow with a large surface area. The large surface area allows for natural aeration to occur and aerobic bacteria to thrive. Aerobic lagoons are generally odor free. Mechanically aerated lagoons are comparable in size to standard anaerobic lagoons and use mechanical (electric) aerators to provide the oxygen for the aerobic bacteria to thrive. Mechanical aerators are generally considered disadvantageous due to the expense of continuous operation.	Aerated lagoons would be used for the CMA ponds. This treatment process is evaluated as Alternative 5 Option A in this Draft SEIS.
Constructed Wetlands	Constructed wetlands are engineered systems designed to optimize the physical, chemical, and biological processes of natural wetlands for reducing biological oxygen demand (BOD) and total suspended solids (TSS) concentrations in wastewater. Wastewater from a septic tank flows through a pipe into the wetland, where the wastewater is evenly distributed across the wetland inlet. Sedimentation of solids with the media substrate occurs. Constructed wetlands are reliable for BOD and TSS removal, and may contribute to nutrient removal when used after a nitrifying unit process.	The USIBWC has decided to consider implementation of mechanical treatment processes over natural treatment processes which require more time, a larger land area and are less capable of timely recovery from a toxic load. Natural processes can typically lead to problems with vectors and odor.
Soil Aquifer Treatment Systems	Soil aquifer treatment (SAT) relies on natural processes to clean treated wastewater. The performance of SAT systems is affected by several engineering design and operational factors. These include: (1) the degree of wastewater treatment that precedes SAT (pretreatment); (2) certain physical characteristics of the SAT system such as depth to groundwater and distance to recovery wells; and, (3) the operational schedule of SAT infiltration basins. Wastewater constituents of primary concern include residual organic material, nitrogen, and pathogenic microorganisms. Effluent pre-treatment determines the quality of reclaimed water applied to percolation basins and is a key factor that can be controlled as part of an SAT system. One of the greatest impacts of effluent pre-treatment during SAT is near the soil/water interface where high biological activity is observed. This condition occurs because both the highest concentrations of biodegradable matter and oxygen are present.	The Tijuana River delta is characterized by highly permeable deposits and could function, in essence, as a pathway to the ocean. Even during the dry season high concentrations of pathogens are encountered offshore of the Tijuana River mouth. There are concerns that the persisting higher bacterial concentrations localized in this area are the result of pathogens carried by underground flows.

Table 2.3-1. Rationale for Eliminating Other Alternatives from Further Consideration (Cont'd)

Alternative	Definition	Rationale for Eliminating this from Further Consideration
Infiltration Basins	Infiltration basins are large uncovered basins which are unlined so that wastewater will percolate over time through the bottom and sides of the basins into the soil, and eventually, to the groundwater table. Effluent from the primary wastewater treatment system is evenly distributed over the infiltration basins and then allowed to percolate. The percolated wastewater passes vertically downward through the soil. A natural river bed can at times, work as a natural percolation basin. Its percolation capacity is limited by the level of the underlying aquifer which can also limit the percolating capacity of nearby areas.	The Tijuana River delta is characterized by highly permeable deposits and could function, in essence, as a pathway to the ocean. Even during the dry season high pathogens concentrations are encountered offshore of the Tijuana River mouth. There are concerns that the persisting higher bacterial concentrations localized in this area are the result of pathogens carried by underground flows.
Surfactant-Modified Zeolite Fields	Zeolites are naturally occurring aluminosilicates characterized by high surface areas and high cation exchange capacities. Zeolites have a unique three-dimensional cage-like structure which has led to their use as molecular sieves. Their cation exchange properties are exploited in many wastewater treatment processes to remove cations such as ammonium and heavy metals. Surfactant-modified zeolite (SMZ) has also been shown to be an effective and economical sorbent for nonpolar organics, inorganic anions, and inorganic cations dissolved in water..	These are specialized treatment methods of relatively clean water and not well-suited for large flows of raw sewage.

Table 2.3-1. Rationale for Eliminating Other Alternatives from Further Consideration (Cont'd)

Alternative	Definition	Rationale for Eliminating this from Further Consideration
Application of Partially-treated Wastewater to Tree Plantations and Crops	Using millions of tons of agricultural manure and municipal solid waste in ways that will take advantage of the nutrients in the wastes and protect the quality of water resources presents significant challenges in some areas of the United States. Presently, much of this material is applied to agricultural crop fields and tree plantations. However, nutrient management requirements and a shrinking amount of agricultural land require that new and innovative methods be pursued. The application of manure and sewage to forests and tree plantations is a natural recycling system that uses available nutrients, produces forest products, and enhances other forest benefits. The environmental benefits of tree plantations and crops to protect water quality are significant. Trees absorb excess nutrients from many sources and break down harmful chemicals, providing a natural cleaning process and protecting soil and water resources. This natural recycling system can reduce the reliance on more expensive treatment methods, such as incineration, landfill disposal, and new treatment plants. At the same time, trees provide visual and sound buffers, reduce atmospheric carbon dioxide, use waste nutrients to produce forest products, and improve wildlife habitat. Trees need large amounts of nitrogen and lesser amounts of phosphorus to grow. These are the same nutrients that pose the greatest threat to water quality through runoff and leaching. Potassium, magnesium, calcium, and sulfur also are needed by trees, but in smaller amounts.	Agricultural application is not feasible in the project area. Additionally, during the winter months the irrigation demand is drastically reduced and other means of treatment and disposal are needed. If the same application rates were used during the winter, there would be raw sewage runoff. Odor and vector problems are also expected to be a disadvantage to this proposed method. The raw sewage could not be applied to crops as the Tijuana sewage has toxicants that would be harmful.
Activated Sludge with Diffusers for High Purity Oxygen (Primary Clarifiers can be used as Final Clarifiers)	The proposed system uses a well known activated sludge treatment process that includes the use of diffusers for injecting high purity oxygen into the wastewater. High purity oxygen activated sludge is an aerobic process very similar to activated sludge except that pure oxygen rather than air is supplied to the wastewater. This is an aerobic process in which bacteria consume organic matter, nitrogen and oxygen from the wastewater and grow new bacteria. The bacteria are suspended in the aeration tank by the mixing action of the air blown into the wastewater. It is proposed that no primary clarifiers be used before the secondary treatment with pure oxygen. The existing primary clarifiers could be used as final clarifiers without spending any additional money for modifying the treatment system. The savings would offset the higher capital cost of building Pure Oxygen generating facilities and higher O&M cost of generating pure oxygen.	This is not a new process, just a blend of known treatment processes. The proposed system attempts to combine, in the same space, the physical processes of a primary treatment with the secondary biological processes of an activated sludge treatment (albeit based on pure oxygen). The optimum requirements of the two individual processes are compromised. CMA ponds had previously been selected as the recommended process.

The other planned projects in the border region that could occur during the same time period as the proposed action are:

- **United States**
  - Proposed 50-mgd Carlsbad Desalination Plant (brine discharge)
  - Tijuana River Valley Habitat Restoration and Trail Program (State Coastal Conservancy)[2]
  - Goat Canyon Enhancement Project (Southwest Wetlands Interpretive Association)
  - Smuggler's Gulch Sediment/Debris Basin (County of San Diego)[3]
  - Tijuana River Watershed Binational Vision Project
  - City of San Diego Multiple Species Conservation Program (MSCP)
  - Tijuana River National Estuarine Research Reserve
- **Mexico**
  - Tecolote-La Gloria WWTP
  - Monte de los Olivos WWTP
  - Lomas de Rosarito WWTP

The City of San Diego MSCP is the only ongoing project at this time (no construction is occurring or planned). The schedule for constructing the other planned projects has not been determined at this time.

2.5 COMPARISON OF ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The environmental impacts of each of the treatment alternatives and discharge options evaluated in this Draft SEIS have been summarized in Table 2.5-1.

2.6 IDENTIFICATION OF PREFERRED ALTERNATIVE

The USIBWC has identified Alternative 4, Treatment Option C, as the preferred alternative in this Draft SEIS. This alternative would enable the USIBWC to meet the purpose and need for achieving long-term compliance with the Clean Water Act in accordance with Public Law 106-457. This alternative was selected for the following reasons:

- Secondary Treatment: Secondary treatment is the environmentally preferred alternative. The Bajagua LLC proposal is one of the secondary treatment alternatives that is designed to meet secondary treatment standards and California Ocean Plan requirements. Preliminary designs and analyses have been prepared.

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2 Purchase and enhancement of natural habitat along the Tijuana River Valley to help alleviate beach contamination that has plagued San Diego's beaches during the rainy season run-off.

3 Construction of a 12.5-acre sediment/debris basin about 1.5 miles west of the SBIWTP.

Table 2.5-1. Summary of Environmental Impacts for Alternative Treatment and Discharge Options for Clean Water Act Compliance at the SBIWTP

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Water Resources(Subchapter 4.1)															
Protection of water quality in the Tijuana River and Estuary by diversion of dry-weather flows at the international boundary	●	B	B	B	B	B	B	B	B	B	B	B	B	B	⊘
Water quality of storm flows crossing the international border into the Tijuana River and Estuary	●	○	○	○	B	B	B	B	B	B	○	○	○	B	⊘
Aquifer recharge potential and groundwater quality in the Tijuana River Basin	⊘	○	⊘	⊘	B	B	B	B	B	B	○	○	○	B	⊘
Water quality objectives for protection of human health in the South Bay Ocean Outfall area of influence	⊘	⊘	B	B	⊘	B	⊘	B	⊘	B	⊘	⊘	⊘	⊘	B
Water quality objectives for protection of marine aquatic life in the South Bay Ocean Outfall area of influence	●	●	B	⊘	⊘	B	⊘	B	⊘	B	⊘	⊘	⊘	⊘	B
Water quality objectives for protection of marine aquatic life in the Point Loma Ocean Outfall area of influence	NA	NA	NA	⊘	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Effects of Punta Bandera coastal discharge on total coliform bacteria concentrations at the international border shoreline	⊘	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●
Effects of Punta Bandera discharge on water quality objectives of the California Ocean Plan for protection of marine aquatic life	●	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●

Legend: ○ No Impact ⊘ Impact Not Significant ● Potentially Significant Impact (Mitigation Required) **B** Beneficial Impact
NA = Impact Not Applicable to this alternative

Table 2.5-1. Summary of Environmental Impacts for Alternative Treatment and Discharge Options for Clean Water Act Compliance at the SBIWTP (Cont'd)

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Geological Resources (Subchapter 4.2)															
Changes to geologic substructure, soils, topography or surface features.	○	○	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	○
Biological Resources (Subchapter 4.3)															
Terrestrial Resources. Loss of up to 30 acres of non-native grassland (sensitive habitat)	○	○	○	⊘	⊘	⊘	⊘	⊘	⊘	⊘	●	●	●	●	○
Terrestrial Resources. Impact to non-native grassland from construction of pipelines connecting SBIWTP and the Bajagua Project treatment plant site	○	○	○	○	●	●	○	○	●	●	○	○	○	○	○
Terrestrial Resources. Disturbance of least Bell's vireo from construction traffic noise along transportation routes to the SBIWTP site	○	○	○	○	●	●	○	○	●	●	○	○	○	○	○
Terrestrial Resources. Impacts to Southwestern willow flycatcher and least Bell's vireo from construction of eastern pipeline corridor in Mexico	○	○	○	○	●	●	●	●	●	●	○	○	○	○	○
Terrestrial Resources. Loss of up to 33-acres of annual grassland at Bajagua Project treatment plant site	○	○	○	○	○	○	○	○	●	●	○	○	○	○	○
Estuarine Resources. Degradation of estuarine habitat at the Tijuana River	●	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Marine Resources. Degradation of benthic communities in vicinity of SBOO resulting in reduction of higher trophic level resources for protected species	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘

Legend: ○ No Impact ⊘ Impact Not Significant ● Potentially Significant Impact (Mitigation Required) **B** Beneficial Impact
NA = Impact Not Applicable to this alternative

Table 2.5-1. Summary of Environmental Impacts for Alternative Treatment and Discharge Options for Clean Water Act Compliance at the SBIWTP (Cont'd)

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Marine Resources. Degradation of benthic communities from increased discharge at Punta Bandera resulting in reduction of higher trophic level resources for protected species	●	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●
Cultural and Paleontological Resources (Subchapter 4.4)															
Cultural Resources. Potential loss of archaeological material as a result on construction	○	○	○	●	●	●	⊘	⊘	●	●	●	●	●	●	○
Paleontological Resources. Potential loss of paleontological material as a result of construction	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○
Air Quality and Odors (Subchapter 4.5)															
Construction-related air pollutant emissions exceed standards	○	○	○	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	○
Increase in air pollutant emissions during operations	○	○	○	⊘	⊘	⊘	○	○	⊘	⊘	⊘	⊘	⊘	⊘	○
Increase in odors during plant operations	⊘	⊘	⊘	⊘	⊘	⊘	○	○	⊘	⊘	⊘	⊘	⊘	⊘	○
Noise (Subchapter 4.6)															
Temporary increase in noise during construction activities	○	⊘	○	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	○
Permanent change in ambient noise levels during operations	○	⊘	○	⊘	⊘	⊘	○	○	⊘	⊘	⊘	⊘	⊘	⊘	○
Land Use (Subchapter 4.7)															
Conflicts with existing or future land use plans, planning objectives or policies	○	○	○	○	○	○	○	○	⊘	⊘	⊘	⊘	⊘	⊘	⊘
Adverse effect on land uses along the Tijuana River and at Imperial Beach as a result of discharge of raw sewage into the Tijuana River	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Legend: ○ No Impact ⊘ Impact Not Significant ● Potentially Significant Impact (Mitigation Required) **B** Beneficial Impact
NA = Impact Not Applicable to this alternative

Table 2.5-1. Summary of Environmental Impacts for Alternative Treatment and Discharge Options for Clean Water Act Compliance at the SBIWTP (Cont'd)

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Adverse effect on Imperial Beach coastal uses from increased discharge of treated and untreated effluent at Punta Bandera	●	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●
Socioeconomics (Subchapter 4.8)															
Economic effect on coastal-dependent businesses at Imperial Beach and along the Tijuana River	●	B	B	B	○	○	⊘	⊘	○	○	○	○	○	○	○
Public Health and Safety (Subchapter 4.9)															
Potential health hazard from contamination and vectors associated with discharge into the Tijuana River	●	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potential health hazard from recreational use of seawater contaminated by increased discharge at Punta Bandera or SBOO	NA	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●
Environmental Justice (Subchapter 4.10)															
Adverse effect on minority and low-income population from discharge of untreated sewage into the Tijuana River (2023)	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Adverse effect on minority and low-income population from temporary beach closures due to high bacterial concentrations in seawater (July/August 2009 – 2023)	⊘	●	●	●	⊘	●	⊘	●	⊘	●	●	●	●	⊘	●
Energy Consumption (Subchapter 4.11)															
Use of nonrenewable energy during construction	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Increase in energy consumption during operations in the United States	○	○	○	○	○	○	○	○	○	○	○	○	○	○	B

Legend: ○ No Impact ⊘ Impact Not Significant ● Potentially Significant Impact (Mitigation Required) **B** Beneficial Impact
NA = Impact Not Applicable to this alternative

- The Bajagua LLC proposal is consistent with Public Law 106-457, the *Estuaries and Clean Waters Act of 2000*, as amended. This alternative would also be consistent with IBWC Minute 311 and the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito, prepared by the State Commission of Public Services Tijuana (CESPT) and the EPA.

- In 1999, USIBWC issued a ROD to build facilities adjacent to the SBIWTP to achieve compliance with secondary treatment requirements. USIBWC and USEPA sought Congressional funding to implement this decision but Congress to date has not provided funding for construction of such secondary treatment facilities in the United States.

- Meets Long-Term Needs of the San Diego/Tijuana Region: This alternative provides an opportunity for Mexico to expand its treatment infrastructure/capacity and reduce or eliminate raw sewage flows into the United States. Alternative 4 Option C promotes potential re-use activities in Mexico thus reducing its dependence on Lower Colorado River water supply and other water sources. This alternative promotes, after 20 years, the enhancement of CESPT's institutional capacity because the facility will be paid in full enabling CESPT to allocate resources to other infrastructure needs. Given projected increased flows in Tijuana, this alternative would provide the best long-term approach to meeting the wastewater treatment needs for the region.

The USIBWC will consider comments on the Draft SEIS concerning the preferred and other alternatives, and will address these comments in the Final SEIS.

CHAPTER 3 – AFFECTED ENVIRONMENT

This chapter provides a description of the existing environment in the vicinity of the SBIWTP, the former Hofer site and the Public Law 106-457 facilities from both a local and a regional perspective, as specified by NEPA (40 CFR 1502.15). Much of the discussion in this chapter has been summarized from the 1998 Draft SEIS and 1999 Final SEIS for the IBWC SBIWTP Long-Term Treatment Operations (CH2M Hill, 1998a and CH2M Hill, 1999). Environmental conditions that have changed since publication of these documents are updated for the appropriate resource area discussions in this chapter. The major changes in the affected environment of the project area include completion of the advanced primary wastewater treatment facilities at the SBIWTP and the SBOO.

This chapter includes a description of the affected environment and provides the basis for evaluating potential impacts for each alternative considered in this SEIS.

3.1 WATER RESOURCES

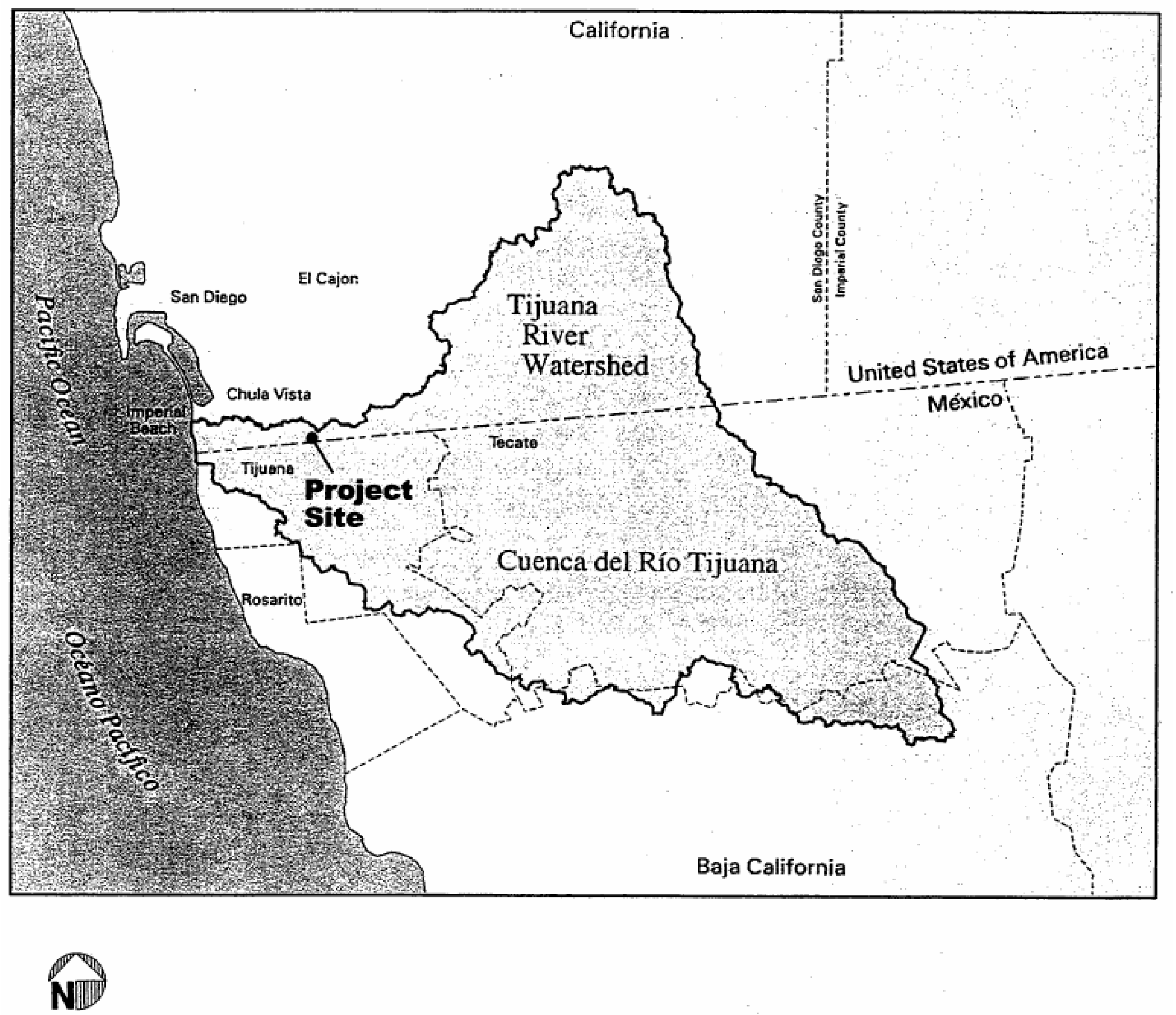
The following discussion is a summary of the water resources potentially affected by the discharge of wastewater into the Tijuana River, and by ocean discharges at the SBOO and Punta Bandera, Baja California. This discussion includes a description of the Tijuana River Watershed where the SBIWTP is located and new treatment facilities would be constructed; and a description of stream flow conditions and water quality of the receiving water. The description of ocean waters identify oceanographic conditions that dictate wastewater transport and potential dilution; water quality conditions at the two ocean discharge locations; and a sediment quality characterization.

3.1.1 Freshwater

3.1.1.1 Tijuana River Watershed

The Tijuana River is an ephemeral stream draining an area of about 1,731 square miles, of which 470 square miles (about 30 percent) are in the United States and 1,261 square miles (about 70 percent) are in Mexico. The fan-shaped drainage area, as shown on Figure 3.1-1, is about 75 miles long and 50 miles wide.

The Tijuana River is formed by the confluence of Cottonwood Creek (Rio El Alamar) and the Rio de las Palmas about 11 miles southeast of the city of Tijuana. The river flows northward through a 6.6-mile concrete flood-control channel in the Tijuana Municipality and crosses the international boundary into California. For the USIBWC, the United States Army Corps of Engineers (1995) has constructed 0.5 mile of concrete channel, 2.0 miles of levees, and an energy dissipator immediately downstream of the international border. After the river crosses into the United States, it continues westward about 5.3 miles and empties into the Pacific Ocean about 1.5 miles north of the boundary.

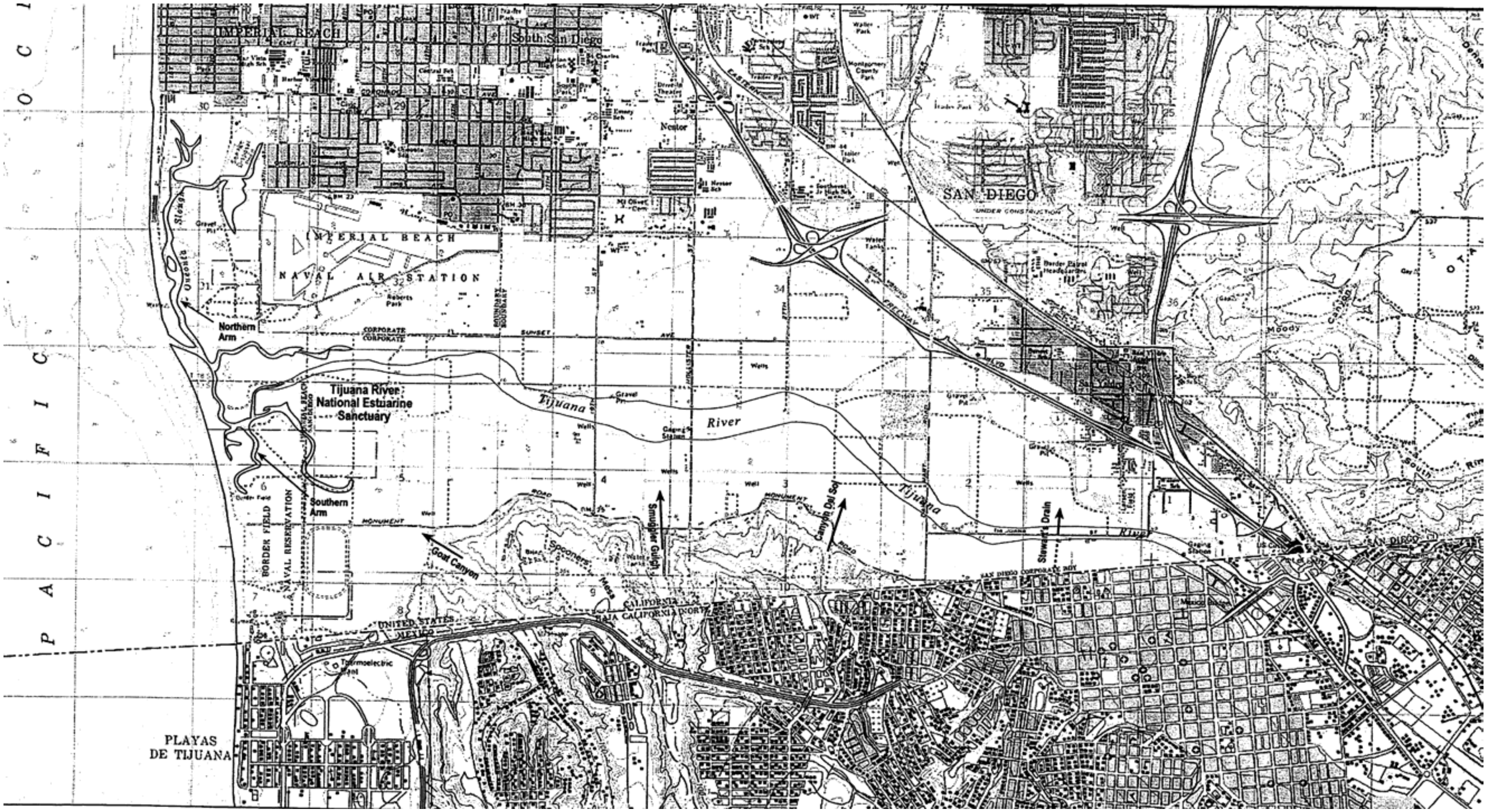


Source: CH2M Hill, 1998a

Figure 3.1-1. Tijuana River Watershed

The Tijuana River can be characterized as a braided alluvial stream that shifts widely across the valley floor during flood stage. An alluvial floodplain forms the floor of the Tijuana River valley. North-trending ephemeral drainages from Mexico enter the valley at Canyon del Sol, Smugglers Gulch, and Goat Canyon. These physical features are shown on Figure 3.1-2.

Predominant soils along the Tijuana River belong to the Chino and Tujunga series. Chino soils have a considerable clay content, low infiltration rates, and higher available waterholding capacity. Tujunga soils are noted for high infiltration rates and low available water-holding capacity. Flood control structures and channelization between the international border and Hollister Street have diverted the river westward, away from Tujunga soils and into the finer silty loams of Chino soils.



Source: CH2M Hill, 1998a

Figure 3.1-2. Surface Water Resources: North Draining Canyons and Tijuana River Estuary

The Tijuana River estuary is approximately 2,500 acres in size, is bisected by the Tijuana River into northern and southern arms, and is bounded by coastal uplands to the north and south, and the alluvial floodplain of the Tijuana River to the east. A 3-mile-long barrier beach separates the estuary from the Pacific Ocean at its western boundary. From the estuary entrance channel, tidal flows are distributed by four channels.

The Tijuana River basin is classified as a Mediterranean, dry summer, subtropical climate. The average annual rainfall across the watershed ranges from about 11 inches near the coast to 25 inches at higher inland elevations, resulting in aquifer recharge of up to 4,500 acre-feet of water in the 5,000-acre alluvial aquifer.

3.1.1.2 Hydraulics of the Tijuana River

Stream Flow

The Tijuana River is an ephemeral stream characterized by low or no flow for many months each year in the United States. Intermittent flood flows are highly variable and are dependent upon rainfall quantity and intensity across the watershed. Brief periods of very high flows, primarily during the rainy season (November through April), are often followed by low or no summer flows. During periods of groundwater overdraft, surface waters provide recharge to the aquifer in direct proportion to the available storage. When the aquifer is full or overflowing, however, groundwater seepage into the lower Tijuana River creates “gaining” stream conditions. These conditions are apparent when ponds and stream flows in the valley are maintained in the absence of surface water input from Mexico.

According to the United States Geological Survey (Izbicki, 1985), the average annual discharge in the Tijuana River at the international boundary from 1936 through 1981 was approximately 33,000 acre-feet/year, compared to a “median” discharge of 659 acre-feet/year. The maximum annual discharge was recorded during the 1979 to 1980 water year when 586,000 acre-feet flowed through the lower Tijuana River valley (Izbicki, 1985).

A hydraulics study to determine the low-flow characteristics of river flows was conducted (Boyle Engineering, 1996b). Flow rates ranging from 1.7 mgd to 34.8 mgd have been modeled to determine the travel times from Stewart’s Drain to the Tijuana River estuary for the selected flows. The predicted travel times vary from a minimum of 4.6 hours at 34.8 mgd to a maximum of 14.4 hours at 1.7 mgd.

Flood Conditions

Flood peaks on the Tijuana River show extreme annual variability. Peak flow events were estimated for the period between 1884 and 1937 by the United States Army Corps of Engineers, and peak flow events were measured between 1937 and 1984 (Philip Williams & Associates, 1987). During these periods, the highest estimated historical flow occurred in 1916, with an estimated peak flow of 75,000 cfs. An event of this magnitude is expected to have approximately a 1-percent chance of occurring in any given year (Philip Williams, 1987). During the floods of 1993, an equivalent flow of 33,000 cfs was recorded in the Tijuana River at the United States-Mexico border.

In the 1970s, Mexico constructed a concrete flood control channel from the international border upstream approximately 6.5 miles to the confluence with Alamar

River. The channel was designed to convey up to 500-year flood flows of 15,000 cfs. The channel has 3 feet of freeboard. The United States constructed an energy dissipator at the downstream end of the flood channel. Mexico has designed and completed environmental review to extend the flood control channel upstream an additional 4 miles to below the Abelardo L. Rodriguez Reservoir. This project will control flooding for approximately 1,034 acres of the floodplain. In addition to providing additional flood protection in Mexico, the channel extension will address problems of surface and groundwater contamination.

As part of the development of the SBIWTP, the south levee of the Tijuana River in the United States has been modified to protect the SBIWTP from flood flows. Additional modifications to the floodplain and low-flow channel are proposed by the City of San Diego for its South Bay Treatment Plant adjacent to the SBIWTP site and Dairy Mart Road bridge crossing improvements to accommodate a 333-year flood.[1]

During the rainy season, the Alamar and Tijuana Rivers are subject to flooding from surface water runoff. The proposed Bajagua Project pipeline route to the Alamar River site would run from the international border along the Tijuana River to its confluence with the Alamar River. The Tijuana River is channelized for flood protection in this reach and the channel is designed for a 500 year flood. From the confluence, the pipeline alignment would generally parallel the south bank of the Alamar River. The flood channel also extends about 0.7 miles up the Alamar River (R.W. Beck, 2004).

There are plans to continue the concrete channel in the Alamar River for another 2.5 to 3.1 miles upstream. The extension of the channel in the Alamar River is part of an on-going flood protection plan being conducted by Comision Nacional de Agua (CNA). According to CNA, 500-year floods have not been finally determined for the Alamar River; however, CNA has estimated the preliminary design capacity of the Alamar flood control channel at 60,000 cubic feet per second.

3.1.1.3 Water Quality of the Tijuana River Estuary

During wet weather, river flows through Tijuana are degraded by sewage, affecting the water quality of the Tijuana River in the United States and its coastal waters. Various studies have been conducted to assess the water quality of the Tijuana River estuary. A study by Gersberg, Trintade, and Nordby (1989) found that, despite continued inflow of sewage containing heavy metals, elevated levels of only cadmium were found in the sediments of both the Tijuana River and southern estuary sites. The study also concluded that only lead was found in levels above an international standard in fish. These levels, however, do not pose a significant public health risk. In contrast, Zedler et al. (1986) found that soils in the marsh habitats near the estuary's main channels, downstream of Goat Canyon and in the Oneonta Slough, were contaminated with heavy metals.

[1] Confirm whether or not these improvements were made as part of South Bay Water Reclamation Plant.

3.1.2 Ocean Water

3.1.2.1 Water Transport

Regional Currents

The currents along the California coast, shown on Figure 3.1-3, are dominated by the offshore, southward-flowing California current. The position and intensity of the California current vary with the season and typically shift onshore in the spring and summer with the advent of the persistent northwesterly winds. The countercurrent flows northward at a depth of 90 feet from Baja California, and transports warm, high salinity Equatorial Pacific water northward. Coastal currents within the California system interact with seasonal upwelling events that bring cool, dense water to the surface and influence the dynamics of the flows.

The South Bay region is characterized as a coastal bight and extends from Point Loma to far northern Baja. The coastal currents in this southern coastal region were measured for a 24-month period between 1986 and 1988 for the Tijuana Oceanographic Engineering Study (TOES) (Engineering-Science, 1988). The mean flow was measured by current meters in 15 stations in United States and Mexican waters. This current meter data were augmented by satellite imagery and other studies (drogue release studies).

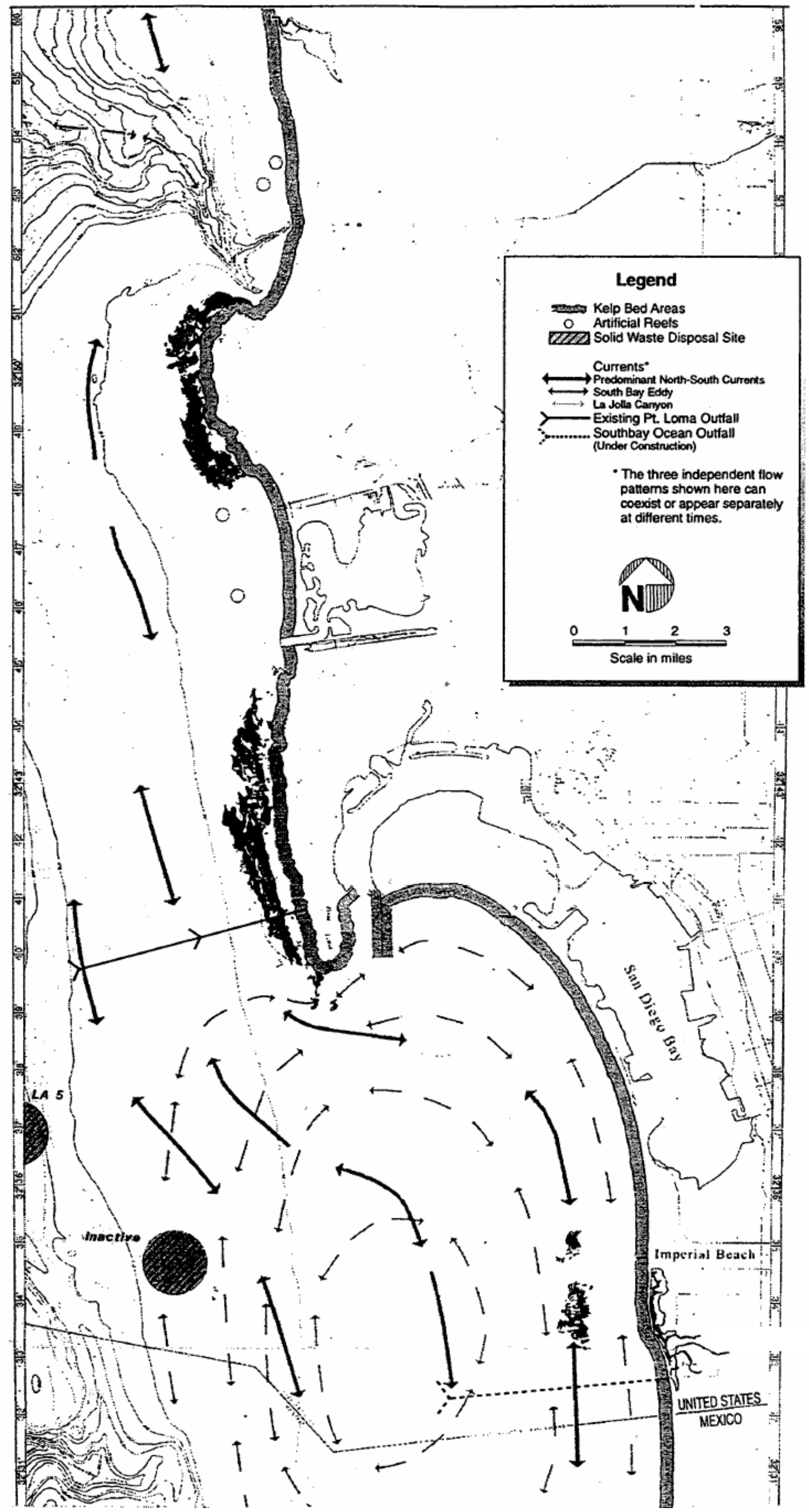
Modeling of the flow patterns was conducted by Hendricks (1988). The mean flow pattern for the first 12 months was predominately to the south. The principal pattern was found to be a relatively uniform longshore flow north and south along the coastline, representing about 60 to 65 percent in the variance in current measurements. A second, intermittent flow pattern consists of a recurring eddy with counterclockwise circulation south of Point Loma of varying intensity that can extend 6.2 to 9.3 miles offshore and approximately 10.6 miles alongshore. About 87 percent of the variability in current meter data is accounted for by these two patterns. The combined flows from these two current patterns are shown in Figure 3.1-4.

Local Currents

Shoreline circulation is predominantly influenced by waves. Northerly swells occur during late fall, winter, and early spring as a result of northerly storms, while southerly swells occur during summer and fall as a result of tropical storms and wind patterns. Wave data from an Imperial Beach monitoring station indicate that the predominant wave direction is from the west to southwest, with a nearly continuous northern transport through the Imperial Beach area and along the Silver Strand.

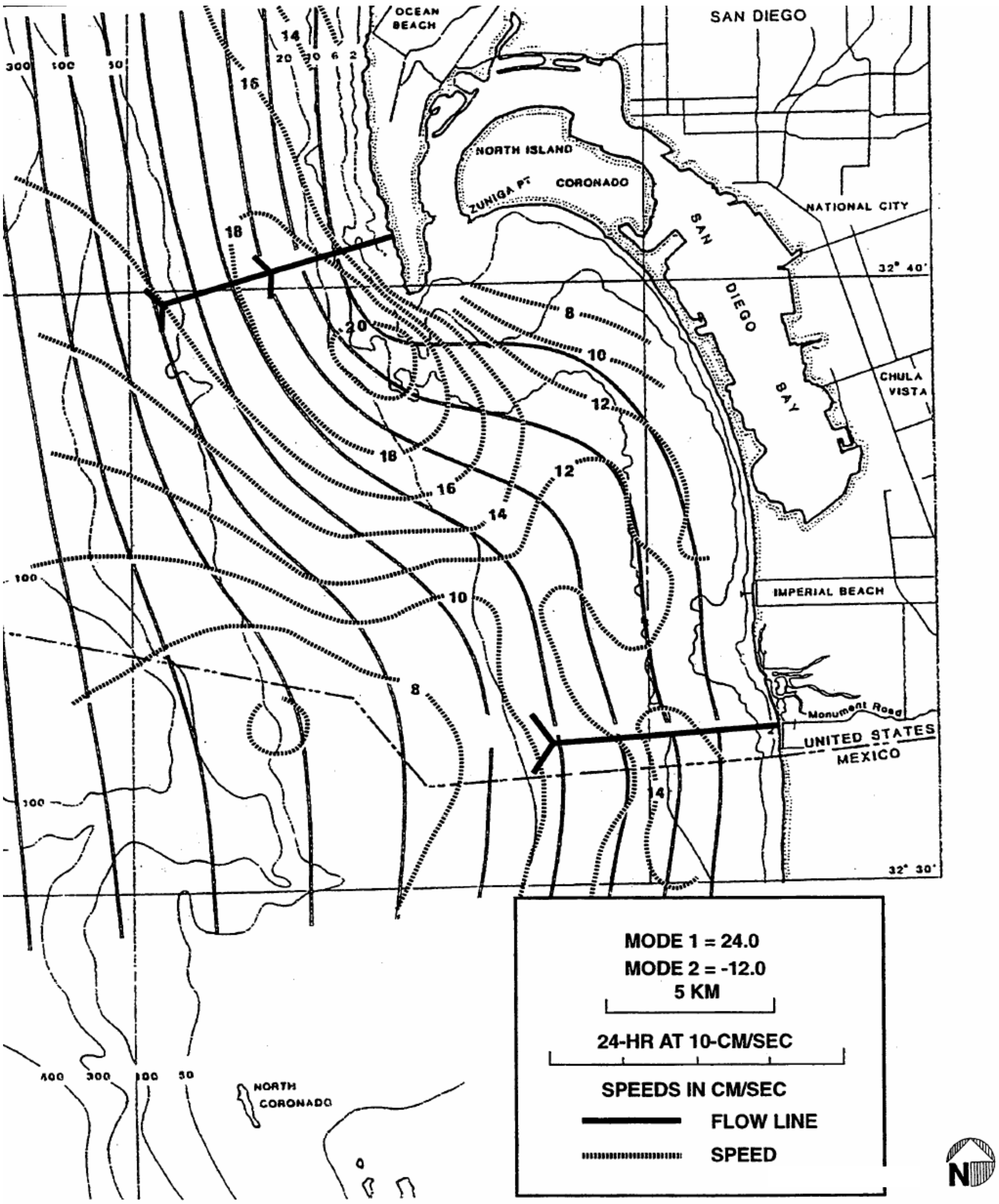
USIBWC monitoring data indicates that the discharge from Punta Bandera in Mexico remains close to the shoreline. Only at depths of less than 3 feet and inshore of the 30-foot contour were effects from the Punta Bandera discharge registered.

For part of 2003 and 2004, two studies in the area have investigated localized currents and their effect on the transport of wastewater. Scripps Institution of Oceanography has implemented a coastal ocean observation system based on Coastal Radar (CODAR) detection of the surface movements. The great benefit of this system is that the currents in a large area can be monitored at the same time and almost continuously. The substantial drawback however is that the system is only capable of detecting surface movements and does not have enough spatial



Source: CH2M Hill, 1998a

Figure 3.1-3. Oceanographic Features



Source: CH2M Hill, 1998a

Figure 3.1-4. TOES Model Current Patterns

resolution to determine wave induced water movements near the shore. Review of preliminary results from the CODAR study, as expected, indicates a dynamic surface environment responding to tides and winds more rapidly that could be noted in the current recordings made at deeper layers during previous current recording campaigns. The surface currents information shows similarities with the supratidal part of the spectrum of the currents measured during the TOES programs.

The second study referred to is the one conducted by Ocean Imaging Inc. This study consists mainly of flyovers for imaging of the ocean surface. The images are taken through specific filters that enhance the detection of surfactants in the ocean. Although the light spectrum recorded in the images can penetrate to some depths below the surface, this type of study is most useful during the winter when the generally submerged plume of the SBOO is at or near the surface. The method is also effective in detecting the presence and movements of the Mexican coastal discharge.

Ocean Imaging reports consist mainly of aerial images from flyovers. The images generally are consistent with the known water circulation in the area as determined from the 1986-1988 current metering. The tidal influence is visible and creates, at times, sharp turbidity boundaries. In some of the winter images, from the bending of the wastefield centerline, there is some indication of a gyre as was detected in the evaluation of the current recordings performed during the TOES 1-3 studies. The Ocean Imaging survey, confirms that the Punta Bandera coastal discharge moves hugging the coastline. The usefulness of the Ocean Imaging survey is limited to the winter months for the SBOO discharge and extends to year round for the Mexican coastal discharge.

Seasonal Changes

Offshore of the South Bay region, nearshore oceanic waters tend to be well mixed during winter months, with similar temperatures and densities found throughout the water column. During the summer, the water column tends to be stratified by water temperature and density at depths between 33 and 65 feet. Water quality data used in the 1996 modeling effort were presented in the TOES report (Engineering-Science, 1988). This pattern of seasonal variability, with a well-mixed water column during the winter with increasing stratification from spring though summer has been found consistently in the South Bay area since discharge through the SBOO was initiated in 1999 (City of San Diego, 2000, 2001, 2002, 2003d, and 2004b).

Continuing water quality monitoring of the SBOO following initiation of discharge confirms the local seasonality of oceanographic conditions, with a shortened “wet” season during the winter and an extended “dry” season from spring through fall. Wet season oceanographic conditions are typified by well-mixed water column characteristics with similar water quality properties in both surface and bottom waters in the vicinity of the discharge. Differences between mean surface and bottom values for dissolved oxygen (DO), temperature, salinity, density and pH from throughout the monitoring area during winter months are the generally the lowest found in the area (City of San Diego, 2003d, 2004b). During the dry season, warmer weather and less storm-related mixing allow increasing stratification of the water column, although seasonal upwelling may vary the depth at which temperature and density gradients (thermoclines and pycnoclines) are found in the water column, and surface bottom differentials are notably higher than in winter. In 2003, surface-to-bottom temperature differentials ranged from 1 to 2°C in winter, while during late summer, temperatures varied from about 6.5 to 8°C between the surface and bottom. (City of San Diego, 2004b). Similar trends were found with salinity, with greatest differential found in spring, and with DO and pH in late spring and summer.

3.1.2.2 Water Quality at the South Bay Ocean Outfall

Monitoring Program

From 1995 to 1998, the USIBWC and City of San Diego conducted baseline monitoring of ocean conditions in the area that would receive treated effluent from the SBIWTP (City of San Diego, 2000, 2001, 2002, 2003d, and 2004b). Monitoring was conducted for water quality, benthic communities, epibenthic species, tissue burden (chemical constituents in fish tissue), and toxicity. The sampling area extended from the tip of Point Loma to Punta Bandera in Baja California, and from the shoreline out to sea at a depth of about 200 feet. Sampling included monthly water column profiles of physical parameters and discrete samples for coliform, oil and grease, and total suspended solids (TSS). Sediment samples were taken for infaunal assessment and for the physical and chemical characteristics of the sediment. Otter trawls (nets) identified demersal (free swimming) fish and macrobenthic communities. Targeted fish species were used for the tissue burden analyses. Bioassays were used to determine ambient toxicity.

Following initiation of wastewater discharge in 1999, the City of San Diego has continued to conduct monitoring in the area of the SBOO discharge as part of the mandated NPDES program. In addition to recurring sampling at designated stations in the vicinity of the SBOO, the City of San Diego conducts region-wide monitoring of benthic conditions of randomly selected sites between Del Mar, California, and the United States/Mexico border. Together, these aspects of monitoring provide both localized conditions and information on regional trends and patterns.

Bacterial Concentrations

Monitoring before SBOO discharge showed that the coliform levels at the shoreline were most affected by wastewater discharged from the San Antonio de los Buenos Wastewater Treatment Plant in the southernmost region of the monitoring area and from wet weather runoff through the Tijuana River. Offshore, the coliform levels were occasionally affected by discharges from Punta Bandera (City of San Diego, 2000, 2001, 2002, 2003d, and 2004b). Following initiation of discharge from the SBOO in 1999, shoreline bacterial concentrations in the South Bay region have been generally lower during spring and summer than those found before treatment plant operations (City of San Diego, 2000).

A compliance assessment by SAIC (2004) evaluated bacterial concentrations in the potential area of influence of the SBOO in the South Bay. Total coliform, fecal coliform, and enterococcus data were evaluated for compliance with permit criteria for single samples and for multi-day averages (30-day, 60-day, and 6-month standards). The analysis compared results of shoreline stations with those of the combined offshore-nearshore stations. In general, a low range of out of compliance events was found in offshore-nearshore stations in contrast with high over-limit events for shoreline stations.

For the combined offshore-nearshore stations, the 2004 compliance assessment concluded that single sample limits generally had low incidences of over-limit events, ranging from about 0.2% to a maximum of 4.86% for all depths and indicator organisms. A general pattern of slightly increased mean percentages of over-limit events (e.g., percent increases of 0.16 to 2.35) was reported during post- compared to pre-discharge years. Most of the over-limit values were restricted to mid and bottom depths, representing a lower incidence of elevated values in surface layers that might represent a greater health risk concerns (SAIC, 2004).

In particular contrast to the offshore-nearshore stations, shoreline stations reportedly had a substantially higher percentage of over-limit events for single sample limits, ranging from 1.85% to 18.16% for the three indicators (total and fecal coliforms and enterococcus). Similar to the offshore-nearshore station results, there were generally small differences in mean percentages between pre- and post-discharge years (0.9-4.23%). Out of compliance values were lowest at the northernmost shoreline stations, and percentages varied substantially (e.g., 1-2 orders of magnitude) among the indicators. The assessment evaluation concluded that over-limit bacterial concentrations appeared to be associated more with contributions from land sources, such as river and stormwater outflow, than with the offshore wastewater discharge (SAIC, 2004).

The 2004 compliance assessment found high out of compliance percentages for the total coliform 30-day standard (e.g., mostly higher than 15-30%) for each shoreline station, except stations located in the northernmost portion of the monitoring region (SAIC, 2004). A similar pattern of lower out of compliance percentages at the northerly stations was evident for the fecal coliform 30-day and 60-day standards, as well as the 30-day enterococcus standard. In the average, much higher out of compliance percentages (e.g., factors of 2-4) were reported for the 30-day standard compared to the 6-month standard (SAIC, 2004).

The 2004 compliance assessment found no clear indications of trend differences between pre- and post-discharge periods for any of the standards. As an exception, enterococcus shoreline results showed a predominant increase in mean compliance (lower out of compliance values) from pre- to post-discharge periods. For enterococcus, the highest mean out of compliance percentages were at the stations adjacent to and south of the river, although one kelp station had some of the higher overall values during the pre-discharge period (SAIC, 2004).

Physico-Chemical Parameters

During the baseline monitoring undertaken between July 1995 and June 1998, it was found that seasonal variations in dissolved oxygen concentrations and pH levels were consistent with the rest of the Southern California Bight. Dissolved oxygen concentrations during the summer ranged from 7.7 mg/L in July to 8.8 mg/L in August and September. Nutrient concentrations in seawater, both dissolved and particulate, were found to be generally lower than other locations in the Southern California Bight.

As part of the annual receiving water monitoring for the SBOO, water quality monitoring data were examined for temporal and spatial trends with respect to temperature, salinity, DO, and other physical and chemical parameters. Average surface water temperatures in the monitoring area in 2003 ranged from 14.7°C in January to 19.3°C in July (City of San Diego, 2004b). In contrast cooler bottom temperatures were found in the area during summer months and warmer bottom temperatures in winter, when the water column was well mixed. Salinities in the SBOO area were similar among months ranging from 33.17 ppt in November to 33.57 ppt in June. Salinities were generally higher at the bottom than at the surface, with highest bottom salinities found during spring months. Dissolved oxygen concentrations in surface waters in 2003 ranged 7.3 mg/l in January to 10.1 mg/l in October. Bottom DO concentrations in the area were generally lowest during spring months. Water quality characteristics in the study area in 2003 were similar to conditions found in previous monitoring in the area and to sampling conducted prior to outfall discharge (City of San Diego, 1996, 2000-2002, 2003d). Water quality conditions in the vicinity of the SBOO are strongly influenced by large-scale and seasonal oceanographic conditions, and show little evidence of impact from the SBOO.

3.1.2.3 Water Quality at the International Border

The physical oceanographic conditions south of the SBOO (ocean outfall site) extending into Mexican waters are similar to and do not differ substantially from those discussed previously for United States marine waters. As noted in Section 3.1.2.1, a countercurrent flows northward at a depth of 90 feet from Baja California. The California current itself turns shoreward offshore of northern Baja California, resulting in an eddy flow within the Southern California bight. Coastal currents in Mexican waters were measured between 1986 and 1988 for the TOES (Engineering-Science, 1988). Shore types found south of the border in Baja are typically wave-cut rocky platforms and gravel beaches.

Bacterial Concentrations

At the present time, untreated wastewater exceeding the capacity of the San Antonio de los Buenos wastewater treatment plant is released to the Pacific Ocean at Punta Bandera. On average in 2004, 6 mgd of untreated sewage was discharged at Punta Bandera based on flow data generated (Parsons, 2004). These untreated sewage discharges currently affect the existing aquatic environment by introducing bacteria, viruses, and toxic or carcinogenic constituents. Wastewater conveyed to San Antonio de los Buenos is discharged at the beach 5.6 miles south of the international border. Waves and currents mix the discharge with ocean water in the surf zone, which extends from the beach out to the breaker line. This mixing dilutes the discharged water and reduces the concentration of pollutants (EPA, 1997).

Information from the Ocean Imaging survey, consisting mainly of aerial images from flyovers, indicates that the Punta Bandera coastal discharge moves very close to the coastline. The images generally are consistent with the known water circulation in the area as determined from the 1986-1988 current metering. The tidal influence is visible and creates, at times, sharp turbidity boundaries. In some of the winter images, from the bending of the wastefield centerline, there is some indication of a gyre that was also detected in the evaluation of the current recordings performed during the TOES 1-3 studies.

Monitoring results show that the San Antonio de los Buenos discharge site affects bacterial densities in Mexico and just north of the international border. The mean annual coliform density near San Antonio de los Buenos was 2,513 coliform forming units (CFU) per 100 mL between July 1995 and June 1996, while the mean annual coliform density near the international border was 1,473 CFU per 100 mL for the same period. In contrast, offshore stations generally had very low coliform densities throughout the year. Only the 30-foot offshore stations showed much effect of the San Antonio de los Buenos discharge site. Total coliform densities decreased with increasing distance north from San Antonio de los Buenos; mean coliform bacterial densities at all other offshore stations were insignificant and near the detection level. Overall, there was a gradient of decreasing coliform densities with increasing distance north of the San Antonio de los Buenos discharge site, which is consistent with known water circulation patterns.

Physico-Chemical Parameters

Water samples were taken at nine shoreline stations located near Punta Bandera in Mexico north to a site at Avenida del Sol next to the Hotel del Coronado in the United States beginning in October 1995. Offshore stations were established at the same time to sample water around the future outfall site and the area inshore to a depth of 30 feet. The offshore sampling area encompassed approximately 140 square nautical miles and included 38 water quality stations.

Differences in temperature, transmissivity, levels of suspended solids, and levels of oil and grease were due to seasonal changes, rather than differences based on location; levels of oil and grease were very low at all stations throughout the study period. Changes in salinity were also related to season rather than location, and were inversely related to temperature. Dissolved oxygen values decreased with depth and distance from shore, and mean values were highest during the summer and early fall. At the 90-foot depth contour, mean values in summer ranged from 7.7 mg/L in July to 8.8 mg/L in August and September.

A study conducted by Wilhelmy and Flegal (1991) measured the concentration and distribution of trace elements from Baja California to the United States/Mexico border. Those trace element studies included lead, cadmium, manganese, iron, and zinc. The study also investigated the relative contributions that human activity and natural processes make towards the trace element concentrations and their distribution.

Marine surface water was sampled from 11 stations along four transects off Baja California. Stations located along the United States-Mexico border and near Punta Bandera had elevated trace metal concentrations compared with more southerly locations. Trace metal concentrations showed both onshore and longshore gradients associated with high salinity and high nutrient concentrations. Nearshore stations were relatively enriched with trace metals compared with more southerly locations, but the values were oceanographically consistent with levels previously reported for the northeast Pacific (upwelled waters). This indicates that, although this area receives high loading of trace metals through wastewater discharges, this loading may not be the predominant factor affecting trace metals distribution. The study suggests that 1 percent of cadmium, 9 percent of zinc, and 29 percent of lead concentrations in marine surface waters in this area originate from point source discharges. This estimate of the relative contribution of trace elements into the California current system by human activities is restricted to contributions from this area and does not include contributions from non-point sources, or human contributions from point sources, outside the Southern California bight.

3.1.2.4 Sediments

Ocean Floor

South Bay shores are characterized by sand beaches, wave-cut rocky platforms, and gravel boulder beaches. Along the ocean floor, soft bottom habitat characterizes the alignment of the SBOO, with a short stretch of cobble bed at a depth of about 55 feet. Coarse shell debris was observed along the outfall alignment from 50 to 80 feet deep, with finer sediments inshore and offshore (Kinnetic Laboratories, Inc., 1990). A study area one mile north and parallel to the outfall alignment indicated significantly more low-relief rocks, boulders, and cobbles from approximately 48 feet out to 90 feet in depth.

In the baseline monitoring, sediments were found to be relatively coarse at all stations throughout the study area, with sands and silts comprising 89 percent and 10 percent of the sediments, respectively. Clays accounted for less than one percent of the sediments. Sediment characteristics in the vicinity of the SBOO have been both similar in the years since initiating the discharge in 1999 and similar to sediments in the area before the discharge. In 2003, sediments were generally found to increase in grain size with depth, although sediments throughout the monitoring areas were primarily composed of fine sands (City of San Diego, 2004b). Sediments in 2003 were coarsest offshore and south of the SBOO, while finer sediments inshore and north of the discharge are likely a result of deposition of sediments from the Tijuana River and from the mouth of San Diego Bay.

Sediments in the San Diego Regional Ocean Monitoring Station averaged 121 feet in depth, and ranged from 89 to 152 feet deep. The sediments averaged 97 percent sand and 3 percent silt and clay.

Sediment Quality

Sediment samples from the TOES (Engineering-Science, 1988) have shown that organic carbon, biological and chemical oxygen demand, sulfides, total nitrogen, arsenic, lead, nickel, zinc, copper, chromium, cyanide, and DDT are highest in the northwest areas of the bay. Sediments were highest in mercury, cadmium, silver, and phenol in the central areas of the bay, and adjacent to the Tijuana estuary, higher sediment concentrations were found for nickel, zinc, copper, chromium, and DDT.

In ongoing monitoring of sediments in vicinity of the SBOO, organic indicators, such as total organic carbon, total nitrogen and sulfides, and trace metals are generally low compared to other coastal areas in the Southern California Bight (City of San Diego, 2000, 2001, 2002, 2003d, and 2004b). Other contaminants such as pesticides, PAH and PCB are only detected rarely in the monitoring area, and do not appear to be related to operation of the discharge. Pesticide contamination was known to occur in sediments in the area prior to construction of the SBOO, and levels in the area, when detected, are similar to concentrations found in prior studies.

3.1.3 Groundwater

3.1.3.1 Groundwater in Tijuana River Valley

Groundwater in the lower Tijuana River valley occurs in three zones: (1) beneath the Nestor Terrace north of the valley, (2) in the alluvial fill underlying the Tijuana River valley, and (3) in the San Diego Formation beneath the alluvium (Dudek & Associates, 1994). Of these three zones, the Tijuana River valley alluvium has been studied and used the most.

The Tijuana River valley aquifer is recharged primarily by direct rainfall, subsurface inflow from adjacent areas, and intermittent flood flows (State of California, 1967; U.S. Army Corps of Engineers, 1990; Rempel, 1992). Surface flows in the river may also provide groundwater recharge (Dudek and Associates, 1994). The amount of groundwater inflow from across the international border has been estimated by various sources at 1,580 acre-feet/year (State of California, 1952); 1,208 acre-feet/year (U.S. Army Corps of Engineers, 1965); and 1,160 acre-feet/year (USIBWC, 1976). There is also potential recharge from water-bearing zones east of I-5 that has not been estimated.

The chief factors contributing to the reduction of groundwater in storage are agricultural pumping and evapotranspiration from phreatophytes (i.e., deep-rooted plants notable for their ability to obtain water from groundwater or the overlying capillary fringe). There is the possibility of minor outflow from the basin toward the north during periods of high groundwater. The amount of groundwater discharging either directly to the ocean or to the lower reaches of the river has been estimated to be 2,090 acre-feet/year during dry years and 2,827 acre-feet/year during wet years (Dudek and Associates, 1994).

It is only when the amount of groundwater removed from a basin chronically exceeds natural recharge from rainfall, subsurface inflow, and intermittent flood flows that the groundwater table levels will begin to decline. The record for the lower Tijuana River valley from 1965 to 1978 shows that groundwater levels can recover from drier-than normal rainfall and less-than-normal runoff as long as groundwater extraction is reduced. This observation is supported by data collected between 1965 and 1978.

3.1.3.2 Groundwater Quantity and Quality

Depending on stream flow, accumulated rainfall, and groundwater pumping, water table elevations vary from year to year and between wet and dry seasons. Sustained high rates of groundwater extraction during the 1950s resulted in a decline in groundwater levels of 23 to 30 feet or more in the Tijuana River valley. By the early 1960s, groundwater table elevations across much of the valley had fallen below sea level, resulting in the intrusion of seawater and highly saline groundwater from underlying and adjacent marine sediments into the alluvial aquifer (State of California, 1975b; Rempel, 1992). By 1967, seawater intrusion had affected most wells up to the United States-Mexico border. This saltwater degradation of the aquifer contributed to the declining demand for groundwater from the Tijuana River valley. As rates of natural recharge exceeded rates of consumption, the resulting annual surplus of water began to overcome years of accumulated deficits, and water levels began recovering.

Increased annual precipitation and runoff between 1978 and 1984, and greatly reduced groundwater pumping for irrigation since 1970 appear to have raised the groundwater levels to within 0 to 15 feet of the ground surface throughout the river floodplain (Philip Williams, 1987; Rempel, 1992). Groundwater levels at the SBIWTP site have been reported to be between 28.5 to 35 feet mean sea level (MSL) (Woodward-Clyde, 1994). The SBIWTP elevation is about 50 feet MSL.

Today, the quality of groundwater in the Tijuana River valley is still characterized by high levels of sodium chloride and total dissolved solids (TDS). These high salinity levels prevent the current use of well water for the irrigation of salt-sensitive crops cultivated within the valley. As a result of lowered groundwater levels and seawater intrusion, groundwater TDS concentrations along the coast have exceeded 27,000 milligrams per liter [mg/L] (the TDS content generally ranges between 1,000 and 1,500 mg/L). In the Department of Water Resources Bulletin 106-2 (State of California, 1967), the Tijuana River valley groundwater was rated generally inferior for domestic use because of its high sulfate and high fluoride concentrations. It was also rated generally inferior for irrigation purposes because of high electrical conductivity, high chloride levels, and high percentage of sodium in the vicinity of Spooner's Mesa. In addition to seawater intrusion problems, the poor quality of the groundwater is also attributed to sodium chloride leaking from the San Diego Formation, irrigation return, and groundwater movement from beyond the international boundary (EPA, 1988).

3.2 GEOLOGICAL RESOURCES

The following discussion is a summary of the geology of the Tijuana River and ocean floor in the vicinity of the SBOO.

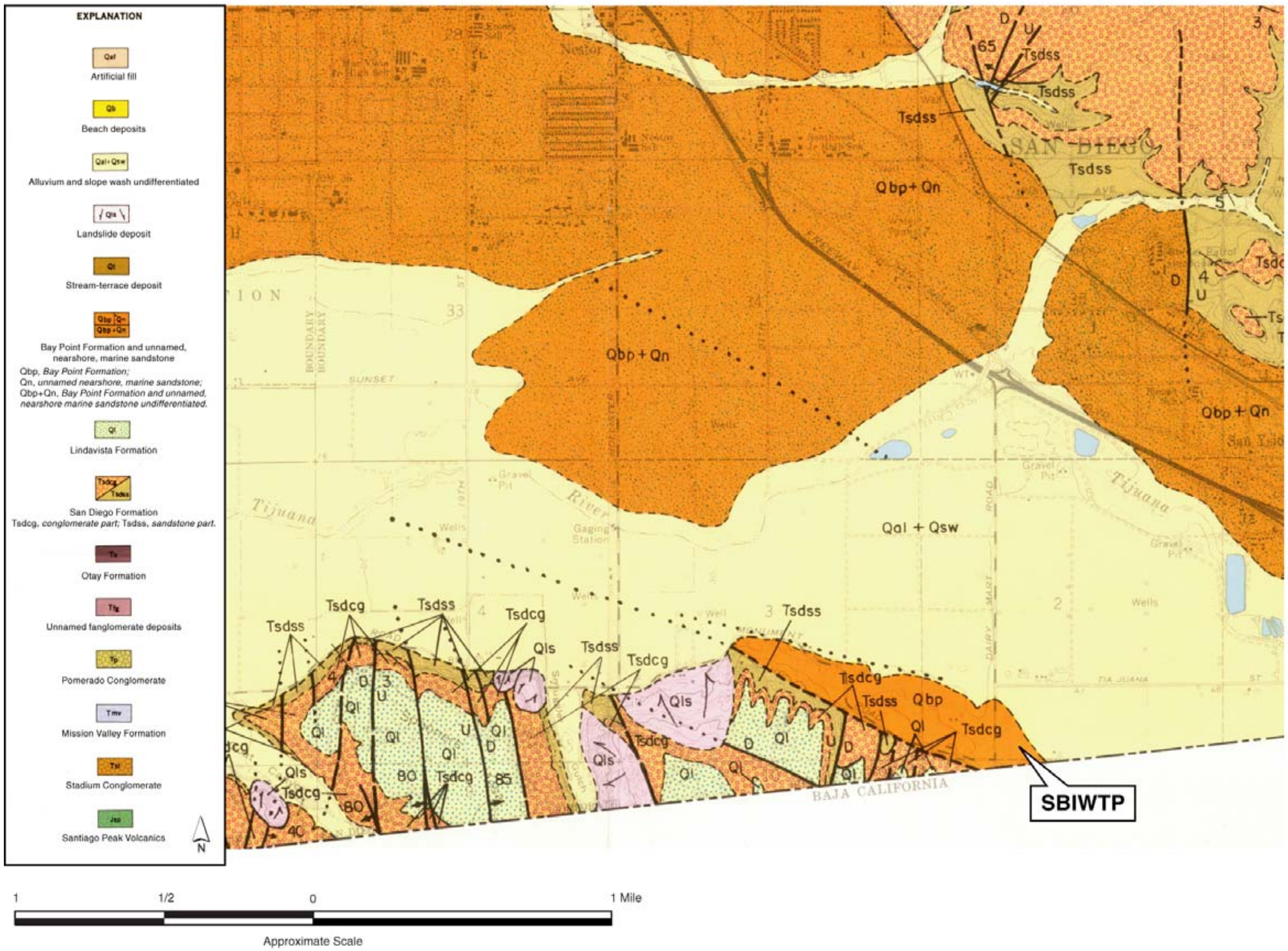
3.2.1 Regional Geology

The project area is located within a coastal plain characterized by a series of wave-cut terraces that extend inland for approximately 10 miles. These terraces have been dissected by various rivers forming a series of wide alluvium-filled valleys. The Tijuana River valley, formed by the Tijuana River, is typical of these alluvium-filled valleys. Quaternary alluvial soils found within these valleys consist primarily of poorly consolidated stream deposits of silt, sand, and cobble-sized particles originating from bedrock sources in the vicinity. Underlying the alluvium and exposed in the bluffs of the Border Highlands to the south and east are Tertiary-age deposits of the San Diego Formation. The Tertiary-age sediments are estimated to range in thickness from 3,000-4,000 feet at the mouth of the Tijuana River. This formation is locally overlain by a thin veneer of early Pleistocene nonmarine sediments of the Lindavista Formation, deposited on the upper terraces. Lower terraces are mantled by late Pleistocene deposits of the Bay Point Formation that also overlie the San Diego Formation (RECON, 1996a). The regional geologic resources in the project area are shown on Figure 3.2-1.

3.2.2 Local Faulting

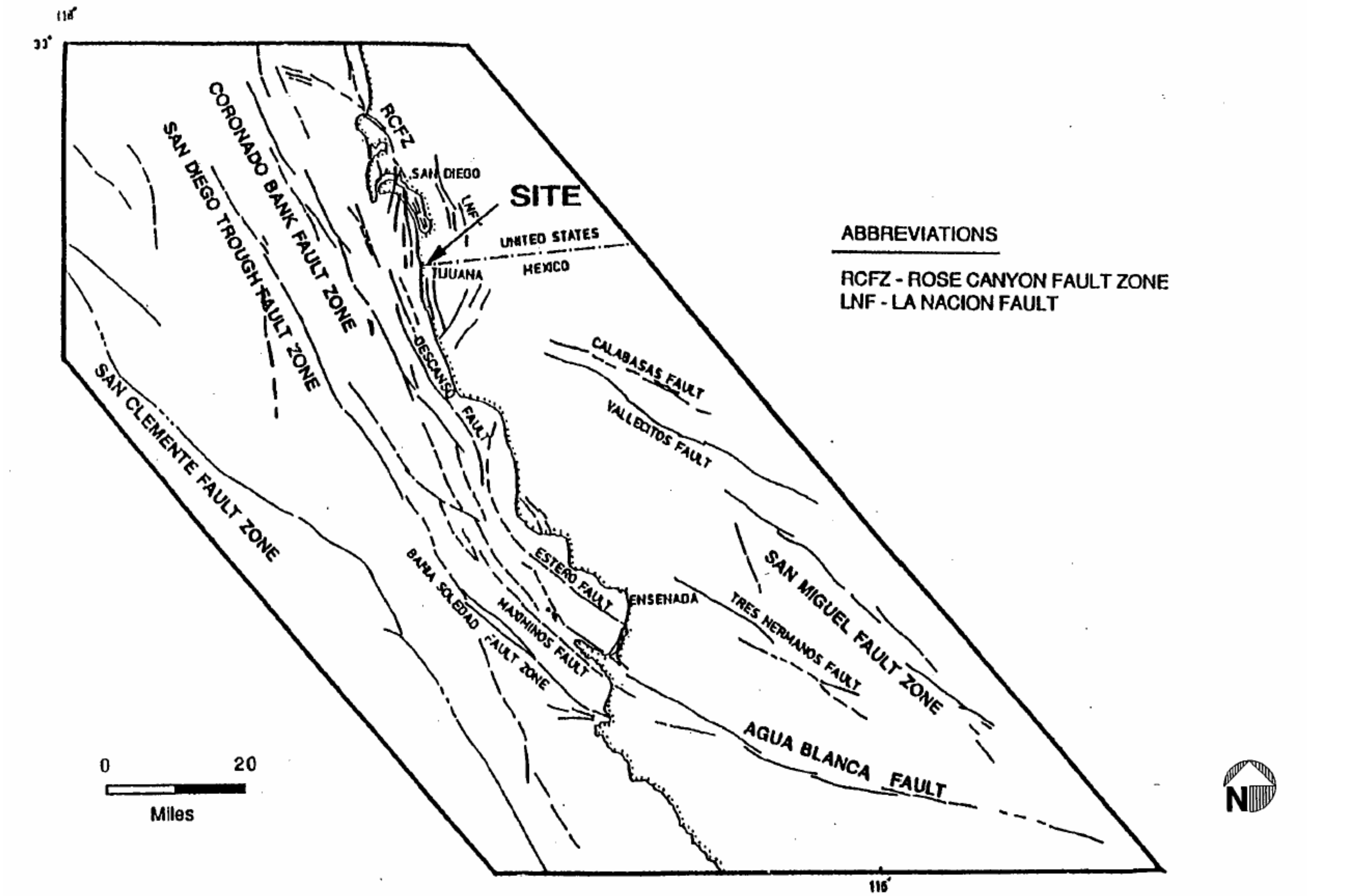
The project area is within a seismically active region subject to the effects of moderate-to-large earthquake events along major faults. The regional faults that could affect the project area include the Rose Canyon, Silver Strand, Coronado Bank, Coronado Shelf, Elsinore, San Jacinto, La Nacion, and San Andreas faults. Those faults nearest to the project area are the Rose Canyon, Silver Strand, Coronado Banks, and Coronado Shelf. These faults are shown in Figure 3.2-2.

The Rose Canyon Fault is a north-to-northwest-trending, complex zone of onshore and offshore faults. It is closest to the SBIWTP, extends across the San Diego Bay and end of Mission Bay before continuing up Rose Canyon and out to sea north of La Jolla approximately 14 miles north of the SBIWTP. The offshore Rose Canyon fault zone includes numerous small- to medium-length faults. The actual number is not well known. These smaller faults, however, are presumed to be in the area of the SBOO. The Rose Canyon Fault Zone is the closest major active fault zone. Estimates of the maximum potential earthquake range from magnitude 6.5 to 7.25, with a maximum 7.0 earthquake typically considered in local seismic hazard evaluations. Significant traces of the Rose Canyon Fault Zone are mapped at distances ranging from about 0.5 mile to about 3 miles from the project area. Recent probabilistic seismic hazard analyses for the San Diego–Tijuana coastal region indicated that the level of seismic shaking associated with a 10 percent probability of exceedance for a 75-year period ranges from about 0.45 gravities (g) to 0.48 g.



Source: Kennedy and Tan, 1977

Figure 3.2-1. Regional Geology of the SBIWTP and Surrounding Area



Source: RECON, 1996a

Figure 3.2-2. Regional Fault Map

A secondary extension of the Rose Canyon fault zone complex is known as the La Nacion-San Ysidro fault zone, which extends north and northeast of the Tijuana River. Mapped fault traces also extend south into Mexico as the Los Buenos faults. These faults are last identified as active during the late Pleistocene and are considered potentially active.

The Silver Strand Fault is the principal fault in the study area. Although the activity of this fault is based on seismic reflection data, much existing data suggest a strong possibility of Holocene faulting, which is consistent with the repeated Holocene activity seen on the adjoining onshore segment of the Rose Canyon fault zone to the north.

The Coronado Bank Fault Zone approximately 7.5 miles offshore is a complex zone of faults and folds believed to extend onshore in the Los Angeles and Ensenada areas. On the basis of Holocene-age displacement of sediments near the ocean floor, various faults within this fault zone are believed to be active.

The Coronado Shelf Fault Zone, which is located about 2.5 miles west of the end of the SBOO, consists of a series of northwest-trending faults that extend from several miles southwest of the tip of Point Loma to the area several miles offshore from Tijuana. The zone of faults appears to consist of two relatively continuous strands that extend about 10 miles across the inner shelf off San Diego.

3.2.3 Historic Earthquake Activity

Since the 1700s, only a limited number of small earthquakes have been reported within a 50-mile radius of the San Diego area. On this basis, the San Diego area is not characterized as a high seismically active area (Seismic Zone 3). Strong earthquakes originating from long distances such as the Imperial Valley or Baja California have produced strong shaking and minor damage in San Diego, but no major destruction has occurred in the area. Earthquakes occurred in 1800, 1862, and 1892 of estimated maximum Modified Mercalli (MM) intensity of VII, VI-VII, and VI, respectively. These earthquakes appear to have had the strongest intensities in downtown San Diego. Recently, only small- to moderate magnitude earthquakes have occurred in the area, the largest of which occurred in July 1986 with a magnitude 5.3 on the Richter scale.

3.2.4 Seafloor Conditions

About 20 to 40 feet of finer-grained sands, silts, and sparse clay layers underlie the eastern two-thirds of the South Bay Ocean Outfall. A varying thickness of up to 40 feet of gravely and sandy alluvial deposits underlies the upper material. Varying depths of deeper, unconsolidated sediments underlie the sandy layers. These soils are subject to liquefaction and settlement due to ground shaking and significant wave height. Tertiary sediments of the San Diego Formation are found at depths of approximately 115 feet.

3.2.5 Geology of SBIWTP Site

The SBIWTP site is located within a coastal plain characterized by a series of wave-cut terraces that extend inland for approximately 10 miles. Soil consists primarily of poorly consolidated stream deposits of silt, sand, and cobble-size particles originating from bedrock sources in the vicinity. The SBIWTP site consists of loose and rocky soil, such that the area has been classified as being highly susceptible to earthquake-induced liquefaction (CH2M Hill, 1999 and 1998a).

The former Hofer site purchased by the USIBWC in 1999 is adjacent to the SBIWTP advanced primary treatment facilities. The site consists of the former Hofer parcel plus a triangular-shaped parcel owned by USIBWC adjacent to the former Hofer parcel on the northeast side. The size of the combined parcels that comprise the former Hofer site is 43 acres. The former Hofer site is characterized as being underlain with fill, alluvium, alluvial fan deposits, old alluvial fan deposits, and terrace deposits (Woodward-Clyde, 1994). Soils are characterized as variably-graded, fine to coarse sands with medium to low amounts of fines (silts and clays). Rocky zones at variable depths contain larger amounts of gravels, cobbles, and localized boulders. Higher elevations to the south were identified as conglomerate San Diego formation. Development of the SBIWTP is constrained by the relatively loose upper alluvial deposit in a saturation-prone area being highly susceptible to earthquake-induced liquefaction (Woodward-Clyde, 1994). Groundwater levels at the site are high due to the proximity of the Tijuana River. At the SBIWTP, maximum seasonal groundwater elevations were estimated at 28.5 to 35 feet MSL (Woodward-Clyde, 1994).

3.3 BIOLOGICAL RESOURCES

This subchapter describes biological resources in the vicinity of the SBIWTP and the Public Law 106-457 alternative treatment facilities. Descriptions of the vegetation and wildlife in the area of the SBIWTP and summaries of recent field activities conducted since publication of the 1999 Final SEIS (CH2M Hill, 1999) are summarized herein.

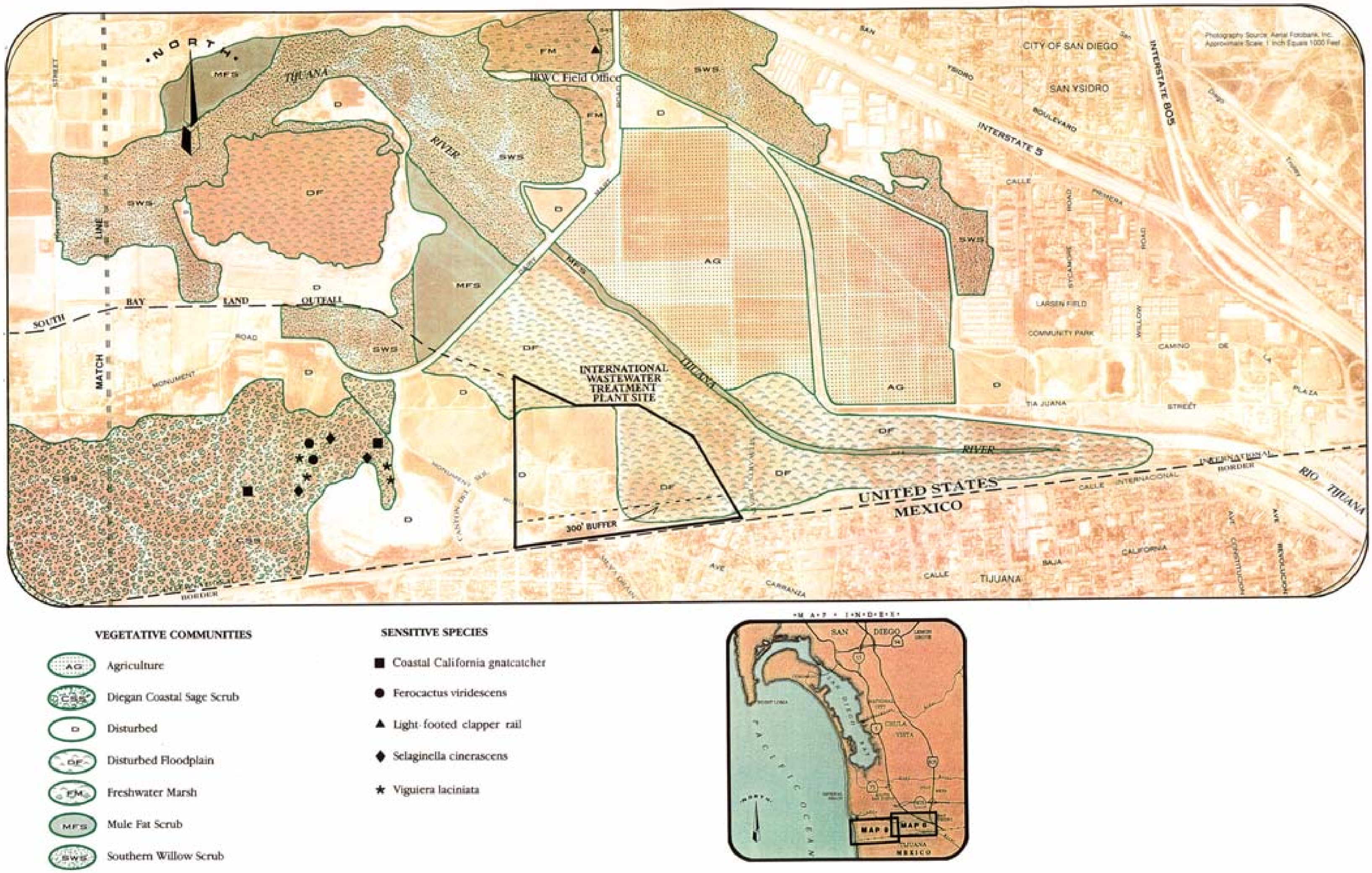
3.3.1 Terrestrial Biological Resources

An overview of the terrestrial biological resources in the vicinity of the SBIWTP, as mapped in 1994, is shown on Figure 3.3-1. Mapping of the SBIWTP property (including the former Hofer site) was verified on October 27, 2004. The results of that survey are summarized below; however, it should be noted that this was a reconnaissance level survey during inclement weather conditions and, therefore, the species lists provided should not be considered exhaustive.

As depicted on Figure 3.3-2, existing land cover types as mapped in October 2004 include disturbed non-native grassland, developed and ruderal/disturbed areas. Vegetation observed at the SBIWTP and on the former Hofer site in October 2004 includes ruderal, weedy species, and newly emerging non-native grasses. A few scattered native plants occur on-site, but do not occur in densities enough to support native wildlife. Wildlife species and plant species observed in October 2004 are identified in Tables 3.3-1 and 3.3-2.

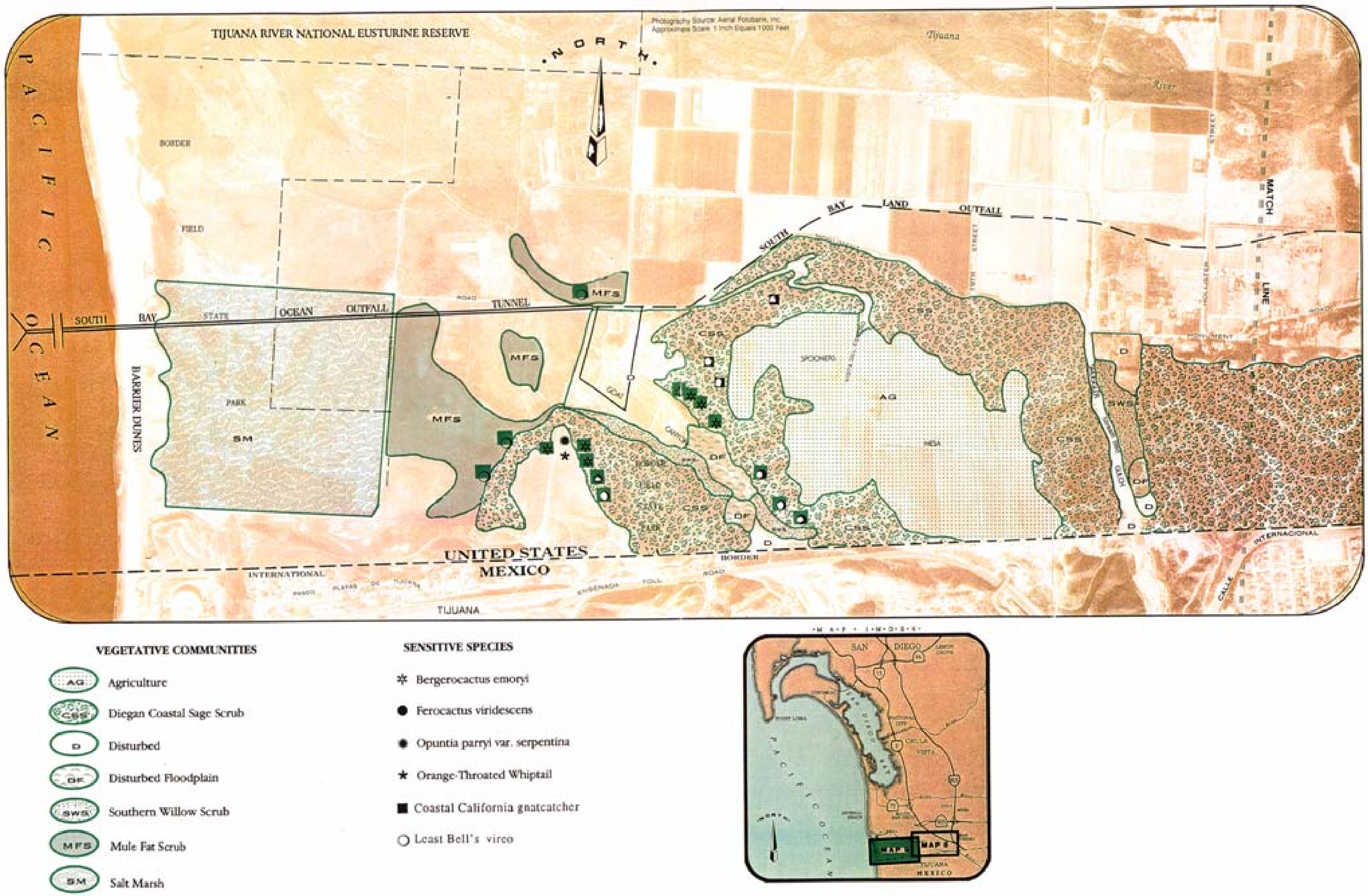
Disturbed non-native grassland: A large portion of the former Hofer site is classified as a disturbed non-native grassland due to a predominance of non-native grasses and weed species. Thick patches of Russian thistle (*Salsola tragus*) occur on-site and grasses are precluded from these areas. Much of the area supports non-native grasses in the understory.

Developed: The developed portions of the site include the existing advanced primary wastewater treatment facility and parking lots. Developed areas also include ornamental landscaping, such as palm trees and small shrubs.



Source: RECON, 1994a

Figure 3.3-1. Biological Resources at the SBIWTP and Vicinity



Source: RECON, 1994a

Figure 3.3-1. Biological Resources at the SBIWTP and Vicinity (Cont'd)

Source: RECON, 2004.

Figure 3.3-2. Existing Land Cover Types (October 2004)

Table 3.3-1. Plant Species Observed at the SBIWTP and Former Hofer Site (October 2004)

Scientific Name	Common Name
Arundo donax L.	Giant reed
Atriplex semibaccata R.Br.	Australian saltbush
Baccharis salicifolia (Ruiz Lopez & Pavón) Pers.	Mule fat, seep-willow
Baccharis sarothroides A. Gray	Broom baccharis
Brassica sp.	Mustard
Bromus diandrus Roth.	Ripgut grass
Chrysanthemum coronarium L.	Garland, crown daisy
Conyza canadensis (L.) Cronq.	Horseweed
Eriogonum fasciculatum Benth.	California buckwheat
Heterotheca grandiflora Nutt.	Telegraph weed
Isocoma menziesii (Hook. & Arn.) G. Nesom	Coast goldenbush
Malosma laurina (Nutt.) Abrams	Laurel sumac
Marrubium vulgare L.	Horehound
Nicotiana glauca Grah.	Tree tobacco
Pinus sp.	Pine
Ricinus communis L.	Castor bean
Salsola tragus L.	Russian thistle, tumbleweed
Schinus molle L.	Peruvian pepper tree
Schinus terebinthifolius Raddi	Brazilian pepper tree
Tamarix sp.	Tamarisk
Washingtonia filifera	Fan palm

Table 3.3-2. Wildlife Species Observed at the SBIWTP and the Former Hofer Site (October 2004)

Scientific Name	Common Name	Status
Elanus leucurus	White-tailed (= black-shouldered) kite	California Fully Protected Species
Charadrius vociferus vociferus	Killdeer	--
Zenaida macroura marginella	Mourning dove	--
Columbina livia	Rock dove	--
Calypte anna	Anna’s hummingbird	--
Sayornis nigricans semiatra	Black phoebe	--
Tyrannus vociferans vociferans	Cassin’s kingbird	--
Corvus brachyrhynchos hesperis	American crow	--
Dendroica coronata	Yellow-rumped warbler	--
Pipilo crissalis	California towhee	--
Melospiza melodia	Song sparrow	--
Zonotrichia leucophrys	White-crowned sparrow	--

Disturbed/Ruderal: The areas mapped as disturbed/ruderal do not support a predominance of non-native grasses. These areas consist of bare ground or decomposed granite and support primarily weed species such as Russian thistle, mustards (*Brassica* sp.), and crown daisy (*Chrysanthemum coronarium*).

Sensitive Biological Resources

Sensitive Vegetation Communities

One sensitive vegetation community occurs on the SBIWTP property. Non-native grassland is a sensitive biological resource according to the City of San Diego (1997) because it provides foraging habitat for raptors. A white-tailed kite was observed foraging in this vegetation at the SBIWTP. Other raptors, such as northern harrier and red-tailed hawk would also be expected to forage on-site.

Sensitive Plants

According to the California Natural Diversity Database (CNDDB, 2004), sensitive plant species historically found in the vicinity of the SBIWTP property include golden-spined cereus (*Bergerocactus emoryi*), sea dahlia (*Coreopsis maritima*), Orcutt's bird's-beak (*Cordylanthus orcuttianus*), and wart-stemmed ceanothus (*Ceanothus verrucosus*). These species occur in native plant communities such as coastal salt marsh and coastal sage scrub, none of which occur on-site. Other species with the potential to occur in the project vicinity include San Diego barrel cactus (*Ferocactus viridescens*), San Diego marsh elder (*Iva hayesiana*), and San Diego County viguiera (*Viguiera laciniata*). These species are not expected to occur within the project area due to the disturbed nature of the site. No sensitive plant species are expected to occur on the SBIWTP property.

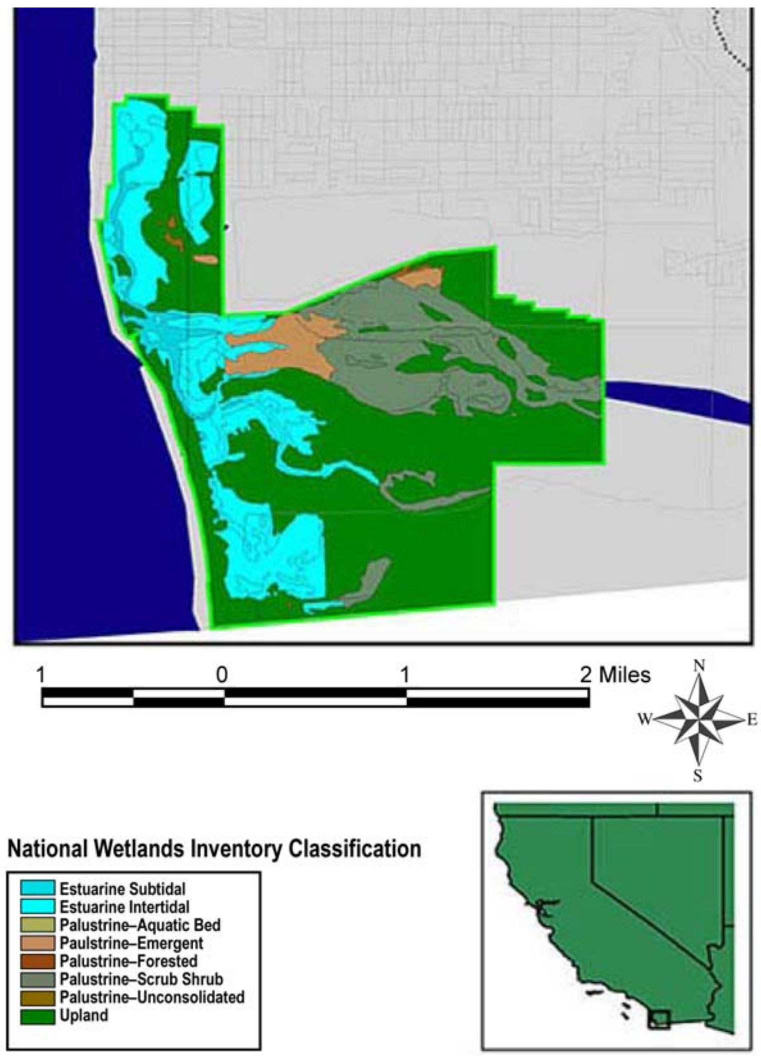
Sensitive Wildlife

According to the CNDDB, sensitive wildlife species known to occur in the general vicinity include least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), western burrowing owl (*Speotyto cunicularia hypugaea*), and Belding's orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*). These species are not expected to occur on-site due to a lack of suitable habitat. Coastal sage scrub habitat, which may support the federally listed threatened coastal California gnatcatcher, does not occur within 500 feet of the project area. The habitat along the Tijuana River to the west of the project area and the Dairy Mart Road Bridge may support the federally listed endangered least Bell's vireo.

Raptors, such as northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and red-shouldered hawks (*Buteo lineatus elegans*), are expected to forage on the disturbed grassland areas of the former Hofer site. During RECON's October 2004 site visit, a white-tailed kite (*Elanus leucurus*) was observed foraging on the former Hofer site. The white-tailed kite is a California fully protected species and their nest sites are considered sensitive biological resources. In addition to the protection offered these species by the Migratory Bird Treaty Act, all active raptor nests are protected under the Fish and Game Code Section 3503.5.

Jurisdictional Resources

All wetland areas are considered sensitive, as are wetland buffer areas. United States Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into waters of the United States (wetland and non-wetland jurisdictional waters) according to Section 404 of the Clean Water Act. The California Department of Fish and Game (CDFG) regulates all changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.



Source: http://nerrs.noaa.gov/TijuanaRiver/tij_bound.html

Figure 3.3-3. Tijuana River National Estuarine Research Reserve

Erosion channels occur along the western border of the former Hofer site. These features are formed from water overflowing from an off-site concrete ditch that is filled with silt. Another erosion area begins at the edge of the paved Monument Road on the south part of the former Hofer site. While the Tijuana River is adjacent to the site, no jurisdictional waters or wetlands were observed on-site.

Multiple Species Conservation Plan

The Multiple Species Conservation Plan (MSCP) is designed to identify lands that would conserve habitat for federal and state endangered, threatened, or sensitive species. Multiple Habitat Planning Area (MHPA) lands are those that have been included within the City's MSCP Subarea Plan for habitat conservation. These lands have been determined to provide the necessary habitat quality, quantity, and connectivity to sustain the unique biodiversity of the San Diego region. The MHPA lands are considered by the City to be sensitive biological resources. The SBIWTP and former Hofer sites are not within an MHPA. The MHPA boundary surrounds the site and includes the adjacent Tijuana River.

3.3.2 Estuarine Biological Resources in the United States

The Tijuana Estuary, part of the National Estuarine Research Reserve (NERR) System and approximately one mile west of the SBIWTP, is classified as a Coastal Plain Estuary. This estuary is comprised of several different habitats, including: sand dunes and beaches, open tidal channels and mudflats; salt marshes (low, middle, and high); fresh-brackish marshes dominated by bullrushes and cattails; and upland riparian habitats as shown on Figure 3.3-3.

The Tijuana River receives unreported effluent discharge (Macías-Zamora et al., 1995). The mouth of the Tijuana River creates a large wetland area designated by the United States National Oceanic and Atmospheric Administration (NOAA) as the

Tijuana River NERR, a federally protected area of environmental importance. As an estuary, the Tijuana river mouth functions as important nursery habitat for numerous commercially important fish species, as well as supporting a complete suite of ichthyofauna native to coastal estuaries and lagoons, such as the tidewater goby (*Eucyclogobius newberryi*).

An important part of the estuary is the regionally specific flora, including cordgrass, pickleweed, saltwort, shoregrass, and the endangered salt marsh bird's beak. The estuary is home to more than 370 species of birds, of which about 320 are migratory, included four federally listed endangered birds: the light-footed clapper rail, the California least tern, the least Bell's vireo, and the California brown pelican. Occasional visitors include peregrine falcons, bald eagles, and golden eagles. The estuary is used for staging and wintering by a variety of waterfowl and shorebirds, with more than 20 species occurring regularly along the sandflats and mudflats. The estuary also supports a small mammal population, including mice, California ground squirrels and rabbits. At least 20 species of fish reside in the small tidal creeks and channels of the estuary, and large populations of crabs, rove beetles, tiger beetles, and wandering skippers can be found, as well (TRNERR, 2000).

The Tijuana River, on the Mexican side of the United States/Mexico border currently receives unreported amounts of both industrial and urban wastes that accumulate in different areas of the river, which are discharged into nearshore coastal waters during winter storms (Macias-Zamora et al., 1995). These seasonal discharges likely have temporary adverse impacts on the local marine environment, but are likely to be of limited duration.

3.3.3 Marine Biological Resources in the United States

The information provided in this subchapter is derived from the Interim Operation SEIS (RECON, 1996a), the Marine Environmental Impacts of the Proposed Secondary Treatment System Report (Kinnetic Laboratories, Inc., 1991), and the Marine Biological Resources Technical Report for the South Bay Ocean Outfall (MBC Applied Environmental Sciences, 1995). This information was updated by MBC Applied Environmental Sciences for the current study.

Benthic Species

Wastewater discharge though the SBOO was initiated in January 1999 (City of San Diego, 2004a). Low flow during the first several years of operations has necessitated the closure of the northern leg and many of the ports on the southern leg of the diffuser system. This limits the discharge area to the distal end of the southern diffuser leg and a few intermediate points near the center of the diffuser. The diffuser discharges approximately 5.6 km offshore at a depth of 27 m.

Monitoring of the benthic environment in the vicinity of the discharge to establish baseline conditions in the area was conducted by the City of San Diego for 3½ years prior to wastewater discharge (City of San Diego, 2004b). Since initiation of wastewater discharge in 1999, the City of San Diego has conducted semiannual benthic monitoring in the area of the SBOO discharge as part of the mandated NPDES program. In addition to recurring sampling at designated stations in the vicinity of the SBOO, the City of San Diego conducts region-wide monitoring of benthic conditions of randomly selected sites between Del Mar, California, and the United States/Mexico border. Together these aspects of monitoring provide both localized conditions and information on regional trends and patterns.

Potential impacts on benthic communities are indicated by changes in infaunal[2] assemblages with respect to the area of discharge. Impacts in the vicinity of wastewater ocean outfalls can include changes in species composition, biostimulation of species richness, biomass and density, and reduction in community stability in the area of impact (Swartz et al., 1986; Zmarzly et al., 1994; Diener et al., 1995). At the Point Loma Ocean Outfall (PLOO) areas within and outside of the influence of the discharge did not differ greatly in species composition but did differ in respect to density, relative abundances of species and temporal persistence (Zmarzly et al., 1994). Differences in benthic community parameters in the vicinity of the PLOO indicate that there are differences between stations within the influence of the discharge and stations outside of the discharge, but that the impacted communities remain characteristic of natural environmental conditions (City of San Diego, 2004b).

Benthic communities in the SBOO area tend to vary predominately as a result of sediment characteristics and depth gradients (City of San Diego, 2000 through 2002, 2003d, and 2004b). The most abundant species encountered in the area is the annelid worm *Spiophanes bombyx*, a species typical of shallow, sandy habitat in southern California. At deeper stations or those with finer sediments, common species include the ophiuroid *Amphiodia urtica* and annelids, including *Chloeia pinnata* and *Pista* sp B. This assemblage is typical of benthic communities transitional between shallow, sandy areas and deeper areas with finer sediment characteristics.

Semi-annual monitoring of the benthic community in the area following the initiation of wastewater discharge has consistently shown no pattern of disturbance relative to the SBOO (City of San Diego, 2000 through 2002, 2003d, and 2004b). Community parameters, such as abundance, species richness, and diversity have been similar among sample years and to predischarge levels. Differences in benthic community assemblages among years are similar to those found at other southern California locations, suggesting naturally occurring variability. In addition, disturbance indices based on the benthic communities in the discharge area, such as the benthic response index (BRI) and the infaunal[2] trophic index (ITI), have consistently been characteristic of undisturbed sediments. Benthic assemblages in the SBOO area following discharge have remained similar to those found in the area prior to discharge and are typical of those found in similar habitats throughout southern California.

Kelp Beds

Small kelp beds occur within the South Bay area and are generally restricted to areas of subtidal rocks, boulders, and cobble within the photic zone (generally depths of 20 to 60 feet [6 to 18 meters]). The forest and dense canopy formed on the water surface provide food and a complex habitat for a highly diverse community of fish, invertebrates, and other algae (RECON, 1996a and b). Two small patches of kelp bed, referred to as the Imperial Beach bed, occur off the Imperial Beach pier and near the Tijuana Slough mouth, about 2.5 miles and 1.0 mile north, respectively, of the outfall pipeline corridor (RECON, 1996a and b). The Imperial Beach bed is attached to boulders and cobbles, as opposed to consolidated reef. Surveys have shown that the bed is highly variable in size and location. Surface canopy observations indicate that, in some years, no kelp is present on the surface while in

[2] Belonging to the benthic fauna living on the substrate and especially in a soft sea bottom.

other years, the bed is quite extensive covering up to almost 180 acres in 1987 (MBC Applied Environmental Services, 2004). Kelp canopy of the Imperial Beach kelp bed covered approximately 20 acres in October 2003, as shown on Figure 3.3-4. Kelp at this location appeared to be expanding through June 2004. Kelp growth in this area is atypical of other kelp beds in the San Diego area, often displaying growth trends opposite of kelp beds at Point Loma and La Jolla. This bed has been harvested intermittently by Kelco, a San Diego kelp harvesting company, but has not been considered a significant resource (Kinnetic Laboratories, Inc., 1991).

Fish

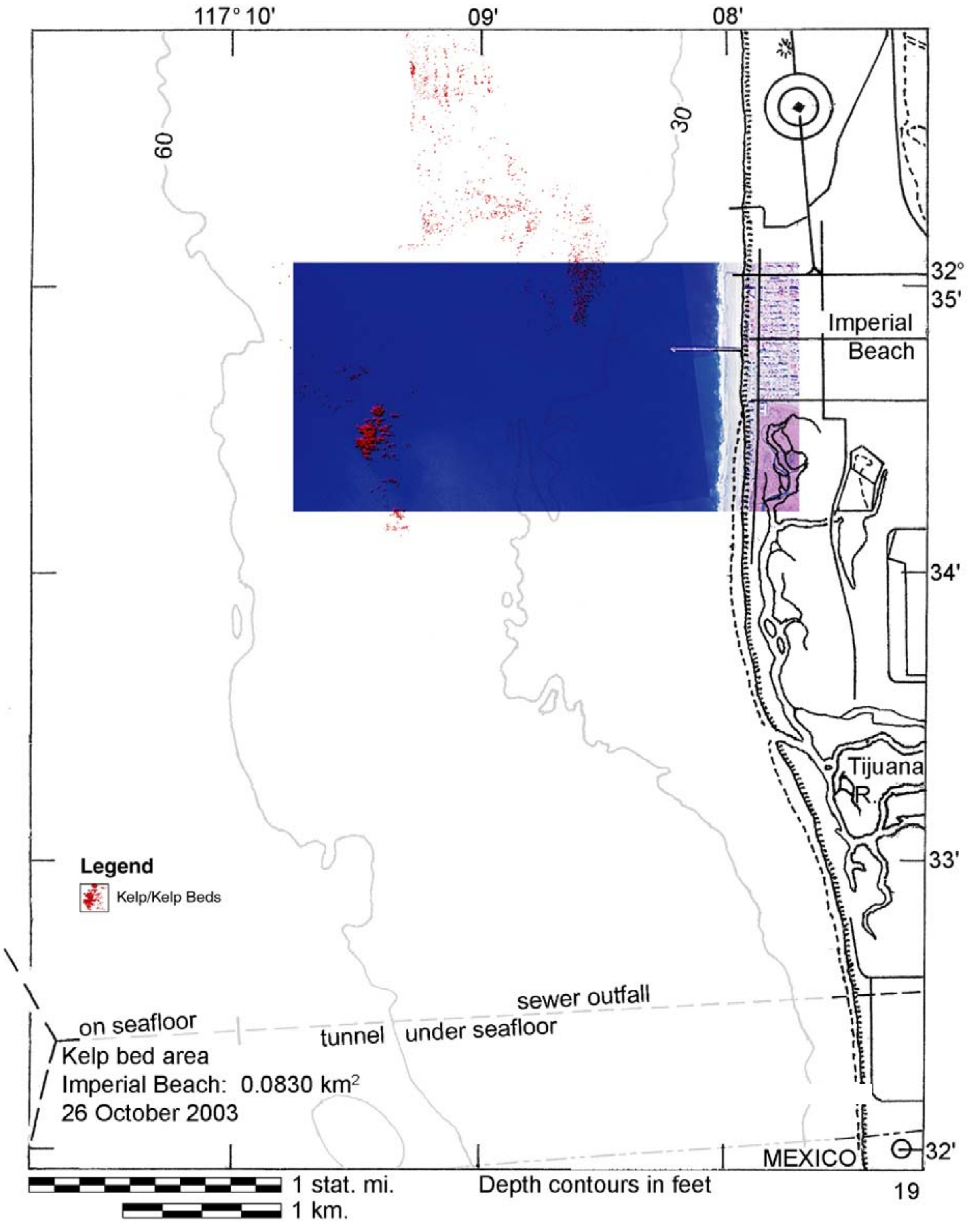
The City of San Diego Metropolitan Wastewater District (MWWD) monitors the biological conditions in the area surrounding the SBOO, ranging from the tip of Point Loma, California in the United States south to Punta Bandera, Baja California Norte in Mexico (City of San Diego, 2000). Fish assemblages of the area that could possibly be affected by the outfall have been sampled quarterly by otter trawl since 1996, almost three years before the onset of discharge (City of San Diego, 2000). The consistent sampling effort has created a significant baseline for the SBOO marine biological assemblage.

The marine fish assemblage of the area surrounding the SBOO is dominated by speckled sanddab (*Citharichthys stigmaeus).* California lizardfish (*Synodus lucioceps*), hornyhead turbot (*Pleuronichthys verticalis*), and California halibut (*Paralichthys californicus*) were also prevalent in otter trawl samples of the demersal fish assemblage. Regular sampling of the outfall area conducted by the City of San Diego MWWD in 2003 indicate a better-than-average biodiversity and abundance when compared to the mean for all stations sampled (City of San Diego, 2004b). In 2003, the Shannon-Wiener diversity index (*H'*) at the two outfall stations cumulatively exceeded the monthly mean for all stations combined for six out of eight samples (City of San Diego, 2004b).

Analysis of historical data from 1996 to 2003 indicate relatively stable abundance and species richness distributions in the vicinity of the outfall (City of San Diego, 2004a). Of notable interest is the onset of discharge occurred in early 1999, with no impact measured in the coastal fish assemblage when compared to pre-discharge baselines (City of San Diego, 2004a).

Marine Birds

Approximately 80 species of seabirds (excluding shorebirds) occur in the Southern California bight, of which only 30 are relatively numerous (Bender et al., 1974; Briggs et al., 1981). Nearly half of the species are winter visitors (October through April). These include loons, grebes, sea ducks, gulls, terns, jaegers, and alcids (murres, auklets, and puffins). A few species are transients, and a small number of strays are recorded each year. Subtropical species in particular may arrive in late summer and autumn. There are six species of summer visitors: sooty shearwaters, three species that nest to the south in Baja California, and two species that nest in the southern hemisphere and spend their winter in Southern California. Year-round avian visitors do not breed in Southern California but can occur somewhere in the bight at any time of year. Three species, California least tern, caspian tern, and elegant tern, nest on southern California mainland beaches and in estuaries. Eleven species regularly nest



Source: MBC, 2004

Figure 3.3-4. Kelp Beds in the Imperial Beach Area

on the Channel Islands, seven of which are year-round residents of the bight. Seabird abundance differs with habitat: 50 to 95 percent of birds are associated with open water, 5 to 10 percent with mainland beaches, and 1 to 4 percent with island beaches.

Three seabird nesting colonies occur in or near the South Bay area (nesting sites in Baja California were not included) (Sowls et al., 1980). Three sites for California least tern, a federal- and California-listed endangered species, occur in Mission Bay, north San Diego Bay, and near the Tijuana River mouth. Western gulls also nest in San Diego Bay. Shorebirds use the shores and waters of the South Bay area. Two protected habitats, the south San Diego Bay and the Tijuana estuary, are immediately adjacent to the South Bay. Shorebirds feed on a variety of prey, including mollusks (clams, snails), worms, crustaceans (crabs, amphipods, isopods), insects (adults and larvae), and other invertebrates. They feed by capturing visible prey, probing in the sand for buried organisms, or prying open sessile organisms on rocks. The majority of coastal shorebirds are migratory and are typically absent in summer. A few other birds such as western snowy plover (federally listed as Threatened), long-billed curlew (California Species of Concern), black oystercatcher, whimbrel, and marbled godwit, are present year-round and may breed locally. The most abundant species include western sandpiper, least sandpiper, dowitchers, willet, marbled godwit, American avocet, sanderling, and semipalmated plover (Warnock et al., 1989). Seabirds, such as gulls, terns, and pelicans, may use the same habitats as shorebirds for resting and nesting.

Marine Mammals

The South Bay (Southern California bight) contains the largest and most diverse populations of marine mammals in temperate waters of the world, with as many as 31 species (Norris et al., 1975). Most are seasonal migrants and are widely distributed throughout the bight. The most abundant species are the California gray whale, Risso’s dolphin, common dolphin, and California sea lion (Schulberg et al., 1989). All marine mammals are protected against harassment, injury, or taking by the Marine Mammal Protection Act of 1973.

Twenty-four species of cetaceans (whales, dolphins, and porpoises) are found in the Southern California bight, six of which are listed as endangered (the gray whale was recently removed from the endangered list). Only the gray whale and the bottlenose dolphin occur frequently near shore in the vicinity of South Bay. All species are either transient or migratory in the area. The whales do not breed in Southern California. Most cetaceans feed on fish and squid, although bottlenose dolphins also take crabs and mollusks (gray whales also feed on bottom invertebrates, but only in their summer grounds in the Bering Sea) (Dohl et al., 1981).

Six species of pinnipeds (seals and sea lions) may be found in the Southern California bight (Bonnel, 1985). Pinnipeds reproduce on land and also “haul out” on beaches and rocky outcrops to rest for various periods of time. The nearest hauling grounds for pinnipeds are the Los Coronados Islands, approximately 7.5 miles south of the international border in Mexico. These islands are considered minor hauling grounds for California sea lions, harbor seals, and northern elephant seals. They prey principally on schooling fish and squid. California sea lion is the most abundant species, accounting for 50 to 90 percent of all pinnipeds (Bonnel et al., 1981). Sea lions are most abundant during summer and autumn, while elephant seals and harbor seals are most abundant in winter and spring. The San Diego basin is used as a foraging area by a few animals associated with the Los Coronados Islands rookery. The area may also be part of a migratory route used by animals from Mexican colonies moving to and from the islands in the Southern California bight (Bonnel et al., 1981)

3.3.4 Terrestrial Biological Resources in Mexico

The following discussion summarizes information on biological resources in the vicinity of Public Law 106-457 facilities in Mexico that could cause impacts in the United States. Specifically, the affected biological environment would include:

- The force main/return pipeline alignment and the Public Law 106-457 WWTP site to the extent they contain suitable habitat for protected species that migrate to the United States; and,
- The proposed Tijuana raw wastewater pump station site and force main to the Public Law 106-457 WWTP site.

The information in this subchapter is generally based on information gained from two reconnaissance studies of habitat at potential Public Law 106-457 treatment plant sites and along the proposed pipeline alignment in Mexico. Biological reconnaissance of one potential site and along the pipeline was conducted in 1999 (Helix, 1999). A second reconnaissance of the Public Law 106-457 WWTP site was completed in March 2004 (Consulting Collaborative, Inc., 2004).

Public Law 106-457 Treatment Plant Site and Vicinity

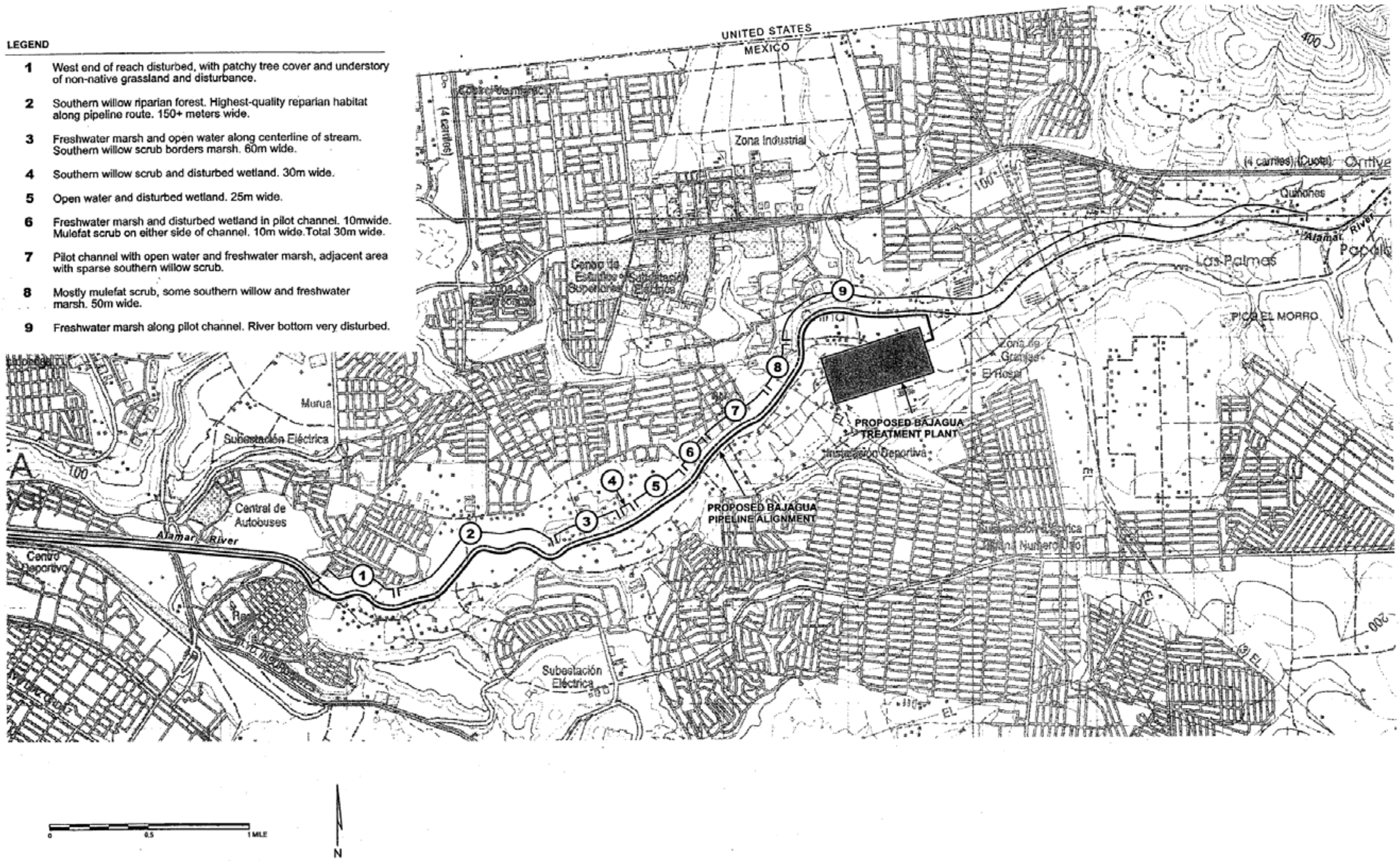
The Public Law 106-457 WWTP site is located in a broad valley south of the Alamar River as shown in Figure 3.3-5. Five habitat types, occur at the proposed WWTP site, as shown on Figure 3.3-6. These habitats are summarized on Table 3.3-3.

Force Main and Return Flow Pipeline Route

The proposed force main and return flow pipeline for Alternative 4 would be located within the same corridor. Biological reconnaissance of this pipeline route conducted in 1999 included mapping of vegetation in the area on a large scale aerial photograph. The photograph and survey identified primitive roads along virtually the entire pipeline alignment route. Construction would generally not disturb vegetation.

The pipeline corridor has been divided in nine (9) segments. The potential for impacts to sensitive habitat exists only where the pipeline route is located in the unchannelized portion of the Alamar River. Habitats along the non-channelized portion of the Alamar River are shown on Figure 3.3-5. Specific habitats along the unchannelized portion of the Alamar River corridor include:

- **Southern Willow Scrub**. Southern willow scrub consists of dense, broad-leaved, winter-deciduous stands of trees dominated by shrubby willows *(Salix* sp.) in association with mulefat *(Baccharis salicifolia).* This habitat occurs on loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. This typically has little understory development because of shading.



Source: R.W. Beck, 2004

Figure 3.3-5. Habitat Along the Public Law 106-457 Pipeline Alignment

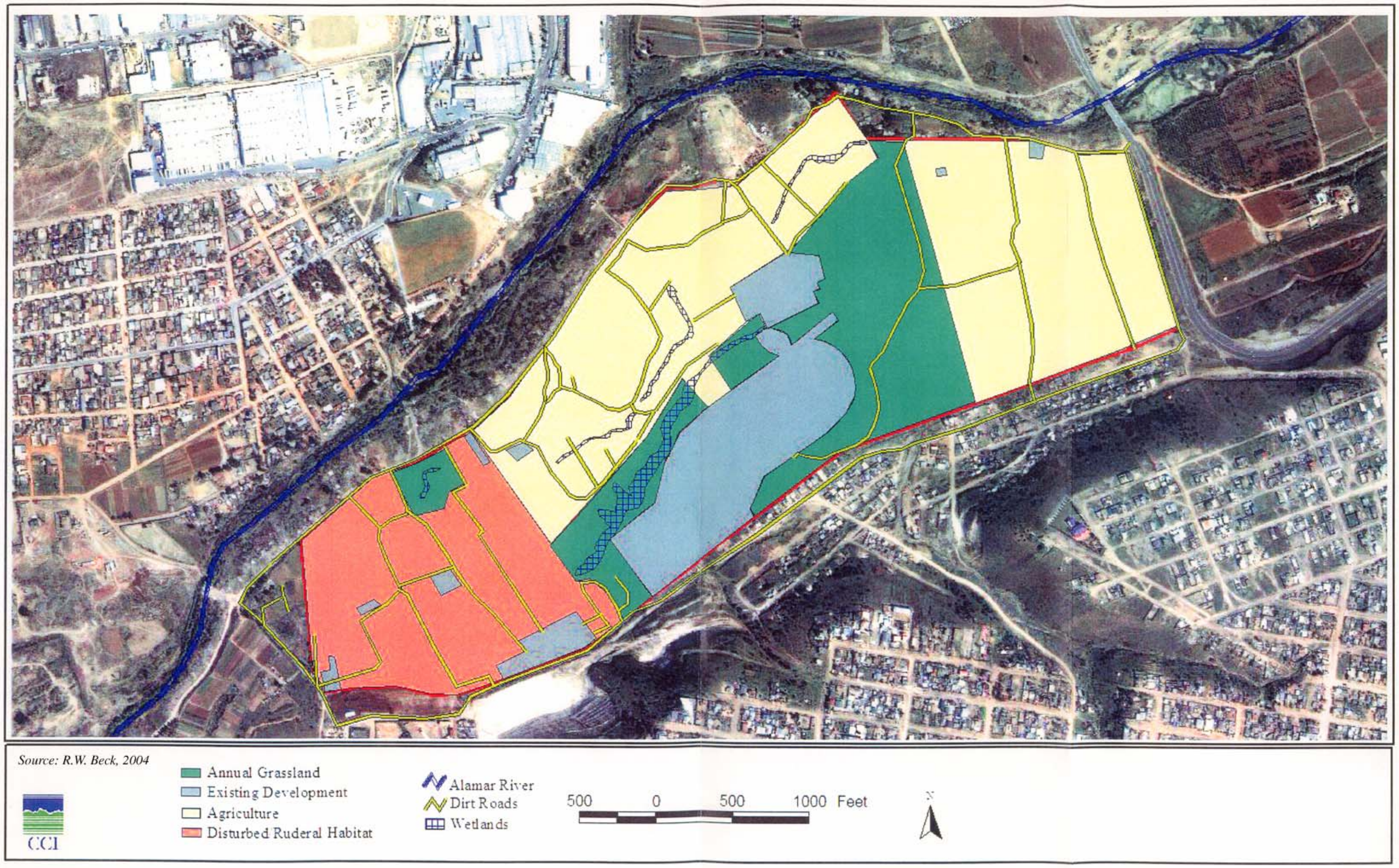


Figure 3.3-6. Vegetation Habitat Resources in Vicinity of Public Law 106-457 WWTP Site

Table 3.3-3. Vegetative Habitats in Vicinity of Public Law 106-457 Treatment Plant Site

Classification	Acres	Description
Streambed	4.5	Non-vegetated streambed habitat occurs on-site and results from natural topography and agricultural practices. These streambeds would not be classified as wetlands under United States federal (United States Army Corps of Engineers) regulations and guidelines; these would be considered wetlands under California regulations and guidelines.
Annual Grassland	44.1	This habitat is dominated by non-native grass species such as ripgut grass (*Bromus diandrus*) soft chess (*Bromus hordeaceus*), oat species (*Avena fatua* and *A. barbata*), and filaree (*Erodium* sp.). This habitat is concentrated within the eastern portion of the site, adjacent to the east side of a race track, which also occupies a portion of the site. The area appears to have been cleared and graded in the past and is fallow, allowing the non-native annual species to thrive.
Ruderal/Disturbed Habitat	48.4	Disturbed habitat includes areas that have been cleared of vegetation or that were used in the past for agriculture, livestock or development with non-native plant species dominating. In addition to dirt roads traversing the property, the western third of the property is occupied by an active cattle ranch. The ranch supports several hundred cattle which have significantly disturbed the existing habitat. The area is predominantly dirt, no longer supporting vegetation. In general, disturbed portions of the site are identified as bare dirt/mud with annual grasses such as filaree within and alongside the dirt roads.
Agriculture	100.4	Agriculture includes land that has been cleared of native habitat for agrarian uses. Roughly the eastern third of the property is comprised of active agricultural fields.
Developed	35.1	Developed land occurs where permanent structures and/or pavement have been placed, preventing the growth of vegetation, or landscaped areas. The significant portion of developed area on the site consists of a horse training track and associated infrastructure. In addition to this large developed area, numerous small pockets of development exist throughout the 11 land-parcels comprising the project site.
Total	**232.5**	
Source: Modified from R.W. Beck, 2004		

- **Disturbed Wetlands**. Human disturbances have altered the ground surface and vegetation to reduce tree and shrub canopy cover and allow for a variety of herbaceous native and exotic wetland species to become established. Characteristic species include mulefat, cattail (*Typha* sp.), giant reed *(Arundo donax),* ox tongue *(Picris echioides),* cocklebur *(Xanthium strumarium* var. *canadense),* and tamarisk *(Tamarix* sp.). Isolated ponds also occur within this mapping unit.

- **Open River Channel**. Portions of the study area are in the Alamar River channel, but support open water or a very sparse cover of vegetation. The lack of vegetation may be the result of scouring from flood flows or human disturbance.

- **Southern Willow Riparian Forest**: Southern willow riparian woodland is an open to dense riparian community that is dominated by willow species (*Salix* sp.). This community occurs along large stream courses where there is an abundant supply of water at or near the surface for most of the year. Within the general area of the pipeline route, this habitat is a dense, tall and wide habitat (Segment 2). This habitat also occurs in a disturbed phase in Segment 1.

- **Mulefat Scrub**. Mulefat scrub is a depauperate, tall, herbaceous, riparian scrub community dominated by mulefat and interspersed with shrubby willows. This habitat occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. Similar to southern willow scrub, this early seral community is maintained by frequent flooding, the absence of which would lead to a riparian woodland or forest.
- **Freshwater Marsh**. Coastal and valley freshwater marsh is dominated by perennial, emergent monocots which reach a height of 12 to 15 feet. This vegetation type occurs along the coast and in coastal valleys near river mouths and around the margins of lakes and springs. These areas are permanently flooded by fresh water yet lack substantial current.
- **Tamarisk Scrub**. Tamarisk scrub is comprised of tamarisk species, all of which are non-native and often completely displace native vegetation subsequent to disturbance. Tamarisk scrub occurs in a few locations along the river channel.
- Disturbed habitat, rural, and developed areas occurs beyond the riparian corridor.

Tijuana Pump Station

Although the specific site for the Tijuana pump station has not been identified, this structure would be located in a disturbed area adjacent to the main Tijuana sewer collector southwest of the Tijuana River. The pipeline would cross under the Tijuana River and continue to the right-of-way for the influent and effluent pipelines between the SBIWTP and the Public Law 106-457 WWTP site.

Sensitive Biological Resources

Vegetation/Habitats

Wetland dependent habitats such as riparian forest, scrubs, freshwater marsh, and open water are considered valuable biological resources. Non-native grasslands are also considered to be sensitive because they are considered to be raptor foraging habitat.

Sensitive Plants

Sensitive plants have not been observed on the Public Law 106-457 WWTP site. Along the pipeline corridor, marsh elder may occur in wetland habitats along the Alamar River. Two listed species, San Diego thornmint *(Acanthomintha ilicifolia)* and Otay tarplant *(Hemizonia conjugens),* may occur in non-native grasslands. The probability of these plants occurring in the area is limited by the disturbed condition of existing habitat.

Sensitive Animals

One sensitive species was observed flying over the northwestern portion of the Public Law 106-457 WWTP site. The Northern harrier *(Circus cyaneus)* is considered to be sensitive because it is recognized as a species of concern by wildlife agencies and because it is a raptor protected by the Migratory Bird Treaty Act. The Northern harrier is known to inhabit coastal, salt, and freshwater marshlands; grasslands; and prairies. Suitable nesting and roosting habitat on the site is limited.

In addition to the northern harrier, six other federal or state sensitive species were judged to have a high potential for occurring on the Public Law 106-457 WWTP site based on habitat types located on or near the site. These include: orange-throated whiptail *(Cnemidophorus hyperythrus beldingi),* Red-diamond rattlesnake *(Crotalus exsul),* Coronado Island skink *(Eumeces skiltonianus interparietalis),* two-striped garter snake *(Thamnophis hammondii),* Coastal rosy boa *(Lichanura trivirgata roseofusca),* and the California horned lark *(Eremophila alpestris acta).* None of these species are federal or state listed as threatened or endangered. These species are listed as federal and state species of concern, except for the California horned lark which is listed only as a state species of concern.

Other sensitive animal species have been identified as having a moderate or low probability of occurring on the site (Consultants Collaborative, 2004). One species that has a low probability due to the type of habitat present is the Quino checkerspot butterfly *(Euphydryas editha quino).* This species is federally listed in the United States as endangered. The principal larval host plant of this species in the San Diego region is dot-seed plantain (*Plantago erecta*). Potential habitat for Quino checkerspot in the region includes vegetation communities with relatively open areas that typically include patches of dot-seed plantain, owl's clover (*Castilleja exserta*), and nectaring plants. These habitats include vernal pools, lake margins, non-native grassland, perennial grassland, disturbed habitat, disturbed wetlands, and open areas within shrub communities. While some of these habitats occur within the study area, they are probably too disturbed to support this species.

Although not observed, this pipeline corridor along the unchannelized portion of the Alamar River may provide habitat for three, potentially occurring, United States federally endangered species: arroyo toad *(Bufo microscaphus californicus),* least Bell's vireo *(Vireo bellii pusillus),* and Southwestern willow flycatcher *(Empidonax traillii extimus).* These species may inhabit the riparian habitats along the river.

3.3.5 Marine Biological Resources in Mexico

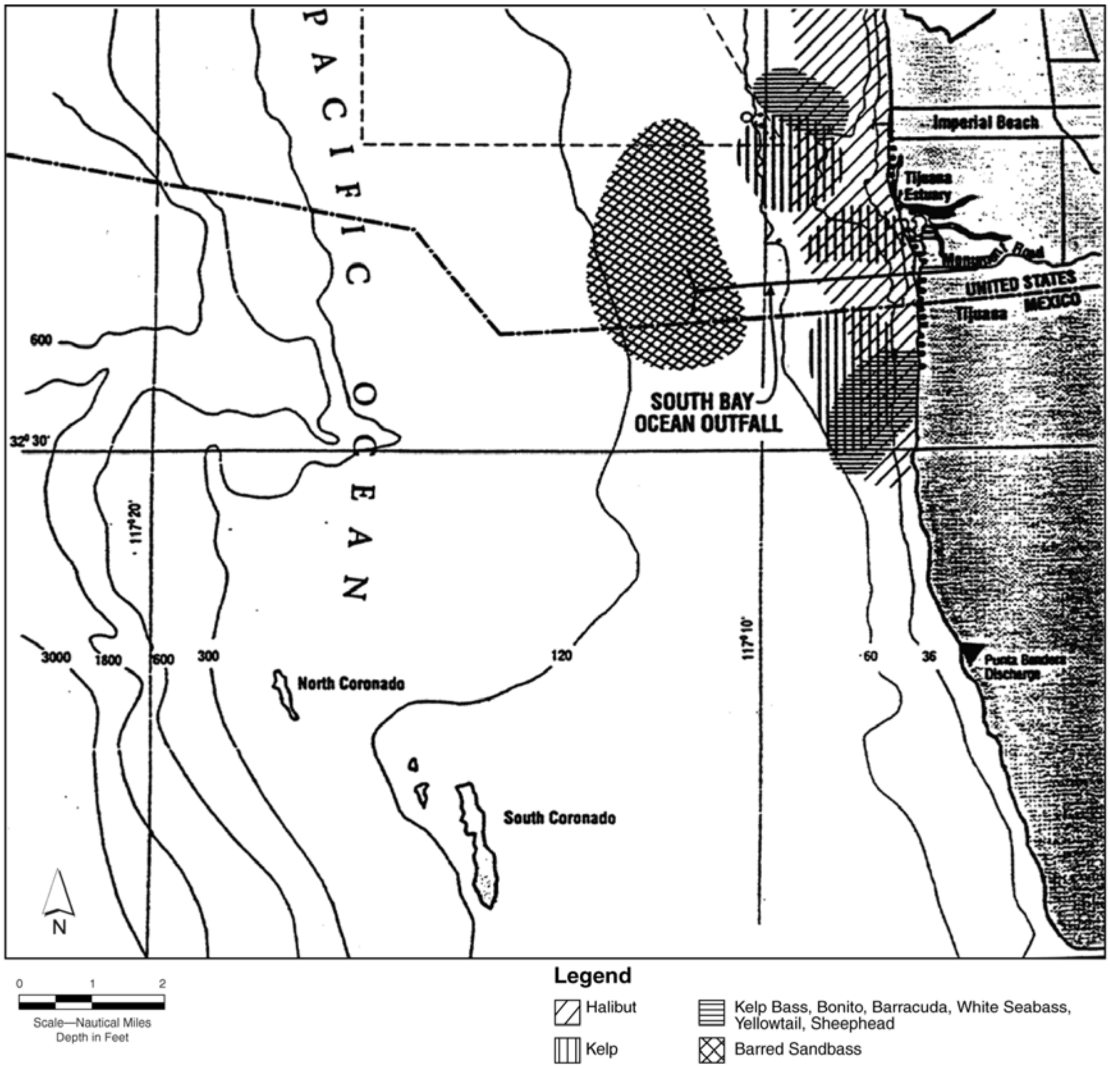
This subchapter describes the marine biological resources in Mexican waters south of the United States/Mexico border.

Benthic Species

The nearshore environment in Northern Baja California, Mexico, is often subjected to continuous discharge of both industrial and urban wastewater (Macias-Zamora et al., 1995). The treatment of the discharged wastewater at treatment facilities such as San Antonio de los Buenos WWTP is usually only primary, while untreated effluents are also commonly released along the coast, particularly during winter flooding. The nearshore benthic environment in the Punta Bandera area is likely highly impacted from the localized discharge of low quality and untreated effluent. Species composition is likely reduced in the immediate area, limited to those species characteristic of highly disturbed environments. Further away, impacts are likely to include biostimulation of the benthic community and dissimilarities in benthic community parameters between discharge and unaffected areas.

Kelp Beds

Kelp beds are located along the same bathymetric contours as kelp beds north of the border. Kelp beds historically have been found by the Coronado Islands and near coastal areas referred to as Popotla, Tijuana, Bahia Descanso, Punta Mesquite, Rosarito Bay, Geronimo Island, the Sacramento reef, and Punta San Carlos. The current extent of the kelp beds could not be ascertained at the time of this study although recent aerial surveys indicated that little kelp is visible and many areas are characterized as having no kelp or scattered plants. The kelp population appears to vary substantially over time. An aerial survey in October 1997 estimated 1,000 tons of visible kelp while an aerial survey in November 1997 estimated 500 tons visible. The visible kelp in the second survey was not located in the same kelp beds as the kelp that was visible in October (Glantz, 1997). The location of kelp beds in Mexico is shown on Figure 3.3-7.



Source: Engineering-Science, 1992.

Figure 3.3-7. Kelp Beds in Mexico

Fish

The nearshore habitat of Punta Banderas, Baja California Norte, Mexico is characterized by open coast, sandy beach habitat with low-relief rocky habitat. Area sediments have been classified as highly polluted due primarily to the San Antonio de los Buenos wastewater treatment plant which discharges on the beach (Macías-Zamora et al., 1995). The ichthyofauna of these habitats are frequently dominated by croakers (Family Sciaenidae), silversides (Family Atherinopsidae), surfperches (Family Embiotocidae), and anchovies (Family Engraulidae) (Allen, 1985). Rosales-Casián et al. (2003) noted several species of economic importance along the northwest coast of the Baja peninsula. These species are comprised of assorted rockfishes (*Sebastes* spp.), California sheephead (*Semicossyphus pulcher*), ocean whitefish (*Caulolatilus princeps*), and kelp bass (*Paralabrax clathratus*). Currently, MWWD monitoring of two sites offshore of the Punta Bandera discharge indicates lower-than-average species richness, abundance, and diversity for both stations sampled in 2003 (City of San Diego, 2004a). A slight increase in abundance and species richness was observed for both Baja California sites after the initiation of SBOO discharge. These two sites continued to rank among the lowest of all stations monitored (City of San Diego, 2004b).

Birds

Based on biological reconnaissance performed for the Bajagua LLC project sites in March 2004, 13 bird species were observed or detected. These birds were red-tailed hawk, Northern harrier, bushtit, mourning dove, scrub jay, common rave, California towhee, house finch, lesser goldfinch, Northern mockingbird, California thrasher, wrentit, California quail and Anna’s hummingbird (R.W. Beck, 2004).

Marine Mammals

The nearest hauling grounds for pinnipeds are the Los Coronados Islands, approximately 7.5 miles south of the international border in Mexico. These islands are considered minor hauling grounds for California sea lions, harbor seals, and northern elephant seals. The San Diego basin is used as a foraging area by a few animals associated with the Los Coronados Islands rookery.

3.4 CULTURAL AND PALEONTOLOGICAL RESOURCES

This subchapter summarizes the cultural and paleontological resources in the vicinity of the SBIWTP and the former Hofer site. Cultural resources are the evidence of how past human residents used and shaped their surroundings. Paleontological resources are fossil remains from past geological periods.

3.4.1 Cultural Resources

Cultural resources include prehistoric and historic-period archaeological deposits, historic-period buildings, structures, and objects, and the locations of traditional cultural practices that continue to the present. The term *cultural resource* refers to resources that are and are not eligible for inclusion in the National Register of Historic Places (NRHP). A cultural resource that is eligible for listing in the NRHP is identified as a *historic property*. A recent review of cultural resource records on file at the South Coastal Information Center was conducted in October of 2004 to update the inventory for the proposed undertaking.

As a federal undertaking, this project is subject to Section 106 of the National Historic Preservation Act. A Programmatic Agreement was executed on March 11, 1994 to guide the cultural resource management actions associated with the SBIWTP. The Programmatic Agreement was signed by the State Historic Preservation Officer, USIBWC, Advisory Council on Historic Preservation, EPA, and City of San Diego. The agreement provided for inventories of archaeological and historic properties, evaluations of eligibility for the National Register of Historic Places, drafting of a background study to guide the eligibility evaluations, and management recommendations. The agreement required the preparation of a management plan for resources that were determined to be eligible for the National Register. It also provided for Native American consultation and coordination, procedures following discovery of unidentified historic properties, and curation of recovered materials.

Historic property inventories and significance evaluations have been completed for the South Bay Land Outfall, SBIWTP, SBOO and associated canyon collectors, conveyance, and pumping facilities (RECON, 1990, 1991; Mariah Associates, 1994a, b, c). In addition, the United States Army Corps of Engineers completed a cultural resources review and evaluation for cultural resources identified at the former Hofer site in 1997 (USACE, 1997). Construction is complete for the SBOO and SBLO. These facilities are not included in the scope of this Draft SEIS.

In general, the project region is host to two types of prehistoric archaeological deposits and two types of historic-period resources. Stone tools or the remains of their manufacture dominate the prehistoric deposits. Within one mile of SBIWTP project are found eight campsites and 20 activity locales. Campsites are the larger of these and typically include stone tools the remains of marine shellfish gathered from the coastal waters and consumed as food at the site location. Thermally altered rock has been reported at some of these sites suggesting fire pits or cooking hearths may also have been present. Activity locales identified in the search contain less material than other site types and are identified by the presence of one or a few stone artifacts. Seven isolated artifacts have been also found in the vicinity of the proposed undertaking. Isolated artifacts are indicative of low intensity use of the general area and are included among the activity locales.

Historic-Period resources are older than 50 years and can be as old as the earliest contact with European explorers in the region. For coastal San Diego, the historic period begins in 1769. Within one mile of the SBIWTP there are seven cultural resources that date to the late 19th and the early and mid 20th centuries. These resources include four standing buildings, two locations with masonry features, and two refuse scatters.

The results of the site records search indicate prehistoric and historic period groups used the general vicinity of the proposed undertaking. There are no examples of long-term settlement during the prehistoric period, but there are examples of temporary camps. These were likely occupied during a portion of the year to support the collection of localized resources when available. The sites identified as activity areas most probably represent the locations of these collection efforts.

During the late 19th and early to mid 20th centuries, the area was increasingly settled. The majority of historic period resources include standing buildings or remnant features associated with permanent residence.

Many of the cultural resources in the search area have been altered or removed through continued use and development of the parcels on which they were identified when recorded. Only four cultural resources were identified within the footprints of the SBIWTP, the former Hofer site, and the City of San Diego SBWRP. Each of these is identified in Office of Historic Preservation records as not eligible for NRHP listing. The other resources in the search area exhibit similar characteristics of integrity to those evaluated and found ineligible.

SBIWTP

The SBIWTP property is bounded on its west by the SBWRP, to the south by Monument Road, and to the north and east by the Tijuana River floodplain. Cultural resources were identified on each of these parcels during past investigations. Reports for these investigations and site records filed for these cultural resources are on file at the South Coastal Information Center.

Most of the SBIWTP has been disturbed as a result of past agricultural practices and construction of the SBIWTP advanced primary wastewater treatment facilities. The former Hofer site has also been disturbed by past agricultural uses and by the creation of a graded lot adjacent to Monument Road. The SBWRP and its associated facilities have disturbed virtually all the parcel. According to the current records on file, CA-SDI-11545 is recorded on the SBIWTP property. This location was recorded in 1989 and at the time was identified as a scatter of marine shell disturbed by modern trash and agricultural activity. Subsequent reviews of the location revealed the shell to be a component of fill material imported to the location and the record was updated to reflect the origin of the scatter. This resource area was inspected during the archaeological monitoring program for geotechnical testing of the SBIWTP site. Site record updates filed by Mariah Associates in 1992 and 1993, indicate that 22 dispersed locations of stone artifacts were identified throughout the western edge of the SBIWTP property.

It is not clear from the site record why isolated stone artifacts were associated with the shell and trash scatter identified in 1989 as CA-SDI-11545. The site was determined to be not eligible for the NRHP, and is not considered to be a historic property. The dispersed artifacts identified by Mariah Associates and are present in the areas where the Public Law 106-457 pump station would be located. In addition, construction of the SBIWTP has subsequently caused additional disturbance in nearly all of the areas where Public Law 106-457 alternative facilities (pump station and pipelines) would be constructed (R.W. Beck, 2004). Although isolated artifacts attributable to CA-SDI-11545 may be encountered, the location is no longer intact as a cultural resource.

Dispersed artifacts recorded as components of CA-SDI-11545 are also found on the former Hofer site. These artifacts were identified during the archaeological monitoring program conducted by Mariah Associates and are also ineligible for NRHP listing. One other prehistoric archeological site, CA-SDI-13486, was identified on the former Hofer site in a backhoe trench near the northwest corner of the SBIWTP. The limited cultural materials that were recovered included a piece of thermally altered rock, a unidirectional core, and two metavolcanic flakes. The site's recorder stated that the existence of thermally altered rock was probably indicative of a buried hearth. The site was tested and found to lack intact cultural deposits and was in a redeposited, disturbed context. Based on this finding, it was concluded that CA-SDI-13486 was not eligible for the National Register.

An evaluation of prehistoric resources on the former Hofer site was included in the Cultural Resources Evaluation for Spooner's Mesa, prepared by the Army Corps of

Engineers in 1997 (USACE, 1997). This document was included in the 1998 Draft SEIS for the IBWC South Bay International Wastewater Treatment Plant Long-Term Treatment Options (CH2M Hill, 1998a).

Associated Collectors, Conveyance, and Pumping Facilities

The City of San Diego has constructed and operates the SBWRP located west of the SBIWTP. Two prehistoric sites, CA-SDI-4933 and CA-SDI-13527, were identified within the footprint of the SBWRP. According to the site record on file at the repository of the South Coast Information Center, CA-SDI-4933 was identified in 1974 and initially recorded with the San Diego Museum of Man as a scatter of stone artifacts and two hearth features. At that time it was assigned the designation SDM-W-1243. A subsequent site record update identified marine shell fragments and re-examined the reported hearths, identifying them as cobble clusters not hearths. Disturbances noted at the time include grazing livestock and grading. The site was inspected again in 1990 during surveys for the Clean Water Program. A site record update filed at that time identified scattered stone artifacts and marine shell fragments, did not include new information regarding the cobble clusters, and identified road construction as recent disturbances at the site location. Mariah Associates filed the most recent update of the record for CA-SDI-4933 in 1992 following archaeological monitoring and survey as part of the SBIWTP construction. Their update identifies road grading across the site, impacts from Dairy Mart and Monument Roads, trails created by tracked heavy equipment, and restates that the site appears to have been graded at some time in the past. The updated record also notes vehicular and foot traffic as ongoing disturbances to the site. The clustered cobbles and thermally altered rock were identified in the 1992 inspection. These components of the site are identified on a sketch map as outside the bounds of the stone artifact concentration and along the crest of the steep slope overlooking Dairy Mart Road. The current record for CA-SDI-4933 states that the site was determined not eligible for NRHP listing. Construction of the SBWRP has consumed this archaeological site.

CA-SDI-13527 is the second site within the footprint of the SBWRP. This resource is also identified in the record as not eligible for NRHP listing. Mariah Associates filed the current record in 1992 during archaeological survey and monitoring efforts for the SBIWTP. According to the record, the site was originally recorded in 1976 with the San Diego Museum of Man as SDM-W-1375. The site consists of scattered marine shell and approximately 20 stone artifacts including cores and flakes, as well as dispersed thermally altered rock. Disturbances include grazing and plowing. The current record for CA-SDI-13527 states that the site has been determined not eligible for the NRHP. As with CA-SDI-4933, construction of the SBWRP has consumed this archaeological site.

Pipelines to convey wastewater between facilities are proposed as part of Alternative 3 of this Draft SEIS. The size and alignment of the pipelines is specific to the alternative and/or alternative option proposed. In general, there is no potential for historic properties to be present in potential pipeline routes. Six of the alternatives include a section of pipeline extending from the SBIWTP southward to the United States/Mexico border. Only CA-SDI-11545 is present at these locations and this site has been determined not eligible for NRHP listing.

3.4.2 Paleontological Resources

A paleontological reconnaissance for the City of San Diego Water Reclamation Master EA was conducted in 1990 (RMW, 1990). This reconnaissance included the SBIWTP site and the South Bay Water Reclamation Plant adjacent to the SBIWTP.

The Tijuana River valley was cut from uplifted marine sandstone deposits, and layers of marine and river alluvium were repeatedly deposited over the last 1.5 million years. The surface sediments are a mixture of recent river alluvium, colluvium, landslide debris, estuarine deposits, and beach sands that overlie older Late Pliocene and Pleistocene deposits of marine and alluvial sandstones and conglomerates. The project area is comprised of four rock formations as described herein and shown on Figure 3.2-1.

San Diego Formation

The oldest sedimentary rocks expected to be found on the SBIWTP are the late Pliocene (2 to 3 million years old) sediments of the San Diego Formation, which are exposed in the southwestern portion of the site next to the international border. The San Diego Formation comprises sandstone and conglomerates that have marine and non-marine origin and produce large numbers and varieties of invertebrate and marine vertebrate fossils throughout the greater San Diego area. The marine sandstone could contain fossilized pelecypods, brachiopods, gastropods, echinoids, barnacles, sea birds, shark and ray teeth, bony fishes, walrus, fur seal, sea cow, dolphin, and whales. A large fossilized whale bone was reported to have been embedded in sands within the Nelson Sloan quarry area. Terrestrial fossils of wood and leaves, ground sloths, cats, wolves, skunks, peccaries, antelopes, deer, horses, and elephants have also been collected from this formation.

The San Diego Formation is considered a unit of high paleontological sensitivity due to its high potential to yield fossils. There are, however, no reports of fossils from this formation in the project area.

Lindavista Formation

The Lindavista Formation is a shallow, early Pleistocene (approximately two million years old) marine sandstone deposit located within pockets within the southern half of the SBIWTP site, usually capping the hills. It has yielded invertebrate, and occasionally vertebrate, fossils along I-15 in the South Bay and in the College area.

The Lindavista Formation is considered to have a low potential of being fossiliferous because of the sporadic nature of the fossil findings associated with this unit. There are no reported fossils in the onsite exposures of this unit.

Bay Point Formation

The Bay Point Formation is the result of marine incursions during the Late Pleistocene (1.8 million to less than 150,000 years ago) associated with periods of glaciation and sea level changes. Bay Point Formation has yielded fossils of land animals and marine invertebrates in the Greater San Diego area, including fossilized corals radiometrically dated at 10,000 to 120,000 years ago.

The Bay Point Formation underlies most of the SBIWTP and former Hofer sites and is considered moderately fossiliferous because of the sporadic nature of the fossil findings associated with this unit. No fossils have been reported from this formation onsite.

Quaternary Alluvium

Quartenary alluvium includes alluvium/slope wash from the bed of the Tijuana River valley. The overall paleontological sensitivity of the project area is considered low because the geologic youth of alluvium generally precludes the existence of paleontological resources within these deposits. Although the fossilized remains of elephants were collected from alluvial deposits in the Tijuana River and near the Imperial Beach Naval Outlying Landing Field, fossil yields from alluvium have been of a very sporadic nature.

3.5 AIR QUALITY AND ODORS

This subchapter presents the existing conditions for air quality, including meteorological conditions, air quality conditions, and odor.

3.5.1 Meteorological Conditions

The project area, similar to coastal areas in San Diego County, has a cool semiarid steppe climate characterized by warm, dry summers and mild, wet winters. The dominating permanent meteorological feature affecting the region is the Pacific high pressure zone, which produces prevailing westerly to northwesterly winds. The project area has a mean annual temperature of 62°F (16.7°C) and an average annual precipitation of 9.2 inches (23.4 cm), falling primarily from November to April. Winter low temperatures in the vicinity of the SBIWTP average about 46°F (7.7°C), and summer high temperatures average about 73°F (22.8°C) (Western Regional Climate Center, 2004).

Prevailing conditions along the coast are modified by the daily sea breeze/land breeze cycle. Fluctuations in the strength and pattern of winds from the Pacific high pressure zone, interacting with the daily local cycle, produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the San Diego Air Basin (SDAB). The afternoon temperature inversion height, beneath which pollutants are trapped, varies between 1,500 and 2,500 feet above mean sea level (MSL). The altitude beneath the inversion layer is the mixing depth for trapped pollutants. In winter, the morning inversion layer is about 800 feet above MSL. Project area elevations range from sea level to an approximate high of 45 feet above MSL. In summer, the morning inversion layer is about 1,100 feet above MSL. A greater change between morning and afternoon mixing depth increases the ability of the atmosphere to disperse pollutants. As a result, the air quality in the project area is generally better in winter than in summer.

The predominant pattern is sometimes interrupted by the Santa Ana conditions, when high pressure over the Nevada-Utah area overcomes the prevailing westerlies, and sends strong, steady, hot, dry northeasterly winds over the mountains and out to sea. Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. At the onset or breakdown of these conditions, or if the Santa Ana condition is weak, air quality can be adversely affected. In these cases, emissions from the South Coast Air Basin to the north are blown out over the ocean, and low pressure over Baja California draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterlies return and send this cloud of contamination ashore in the SDAB. There is a potential for such an occurrence about 45 days of the year, but San Diego is adversely affected on only about five of these days. When this event occurs, the combination of transported and locally produced contaminants produces the worst air quality measurements recorded in the basin.

3.5.2 Air Quality Conditions

The project area is within the SDAB. Air quality at a particular location is a function of: (1) the type and amount of pollutants being emitted into the air locally and throughout the basin; and, (2) the dispersal rates of pollutants within the region. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards established by the California Air Resources Board (CARB) and federal standards established by the USEPA. The CARB and EPA have established ambient air quality standards in order to define the level of air quality necessary to protect human health with an adequate margin of safety. Ambient air quality standards are described in Chapter 6 (Table 6.1-3).

The concentration of pollutants within the SDAB is measured at 11 stations operated by the County of San Diego Air Pollution Control District (SDAPCD, 2004) and CARB (CARB, 2004a). The station closest to the project area and measuring a full range of pollutants is located in Chula Vista.

The number of days annually from 1999 to 2003 during which state and federal standards were exceeded in the SDAB overall is presented in Table 3.5-1. These same parameters for the Chula Vista monitoring station are shown in Table 3.5-2. Ambient air quality for the Chula Vista monitoring station is shown in Table 3.5-3. The information shown in Tables 3.5-1 through 3.5-3 characterizes existing air quality conditions in the San Diego area. These conditions contribute to the classification of attainment of air quality standards and also serve as the basis for the evaluation of air quality impacts from new projects.

Ozone

Ozone presents special control strategy difficulties in the SDAB because of climatological and meteorological factors. Ozone is the end product of the chain of chemical reactions that produces photochemical smog from hydrocarbon emissions. A major source of hydrocarbon emissions is motor vehicle exhaust. In the SDAB, only part of the ozone contamination is derived from local sources. Under certain conditions, contaminants from the South Coast Air Basin (such as the Los Angeles area) are windborne over the ocean and are transported into the SDAB. When this occurs, the combination of local and transported pollutants produces the highest ozone levels measured in the basin.

Table 3.5-1. Summary of Air Quality Data for the San Diego Air Basin (1999 – 2003)

Pollutant	Number of Days Over Standard									
	State					Federal				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Ozone (1-Hour)[a]	27	24	29	15	23	0	0	2	0	1
Ozone (8-Hour)	NA	NA	NA	NA	NA	17	16	17	13	6
Carbon Monoxide (8-Hour)	0	0	0	0	1	0	0	0	0	1
Sulfur Dioxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Dioxide	0	0	0	0	0	NA	NA	NA	NA	NA
Particulates (PM_{10})	19	18	21	29	24	0	0	0	0	2

Source: CARB, 2004h, i, j, k and l
SDAPCD, 2004

[a]State Standard for Ozone > 0.09 ppm/hour; Federal Standard > 0.12 ppm/hour.

NA = Not Available

Table 3.5-2. Number of Days Air Quality Standards Were Exceeded at Chula Vista Monitoring Station (1999 – 2003)

Pollutant	Year				
	1999	2000	2001	2002	2003
Ozone (1-Hour)					
Federal 1-hour standard (0.12 ppm, 235 μg/m^3)	0	0	0	0	0
State 1-hour standard (0.09 ppm, 180 μg/m^3)	4	0	2	1	0
Ozone (8-Hour)					
Federal 8-hour standard (0.08 ppm, 157 μg/m^3)	0	0	0	0	0
State 8-hour standard (Not Applicable)	--	--	--	--	--
Carbon Monoxide					
Federal 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	0	0
State 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	0	0
State 1-hour average (20 ppm, 23 mg/m^3)	0	0	0	0	0
Nitrogen Dioxide					
Federal annual average (0.053 ppm, 100 μg/m^3)[a]	0.019	0.017	0.017	0.018	0.018
State 1-hour standard (0.25 ppm, 470 μg/m^3)	0	0	0	0	0
Sulfur Dioxide					
Federal 24-hour average (0.14 ppm, 365 μg/m^3)	0	0	0	0	0
State 1-hour average (0.25 ppm, 655 μg/m^3)	0	0	0	0	0
State 24-hour average (0.04 ppm, 105 μg/m^3)	0	0	0	0	0
Suspended 10-micron Particulate Matter (PM_{10})					
Federal 24-hour average (150 μg/m^3)	0	0	0	0	0
State 24-hour average (50 μg/m^3)	4	1	2	1	2

Source: CARB, 2004b, c, d, e, f and g.
SDAPCD, 2004

ppm parts per million
mg/m^3 milligrams per cubic meter
μg/m^3 micrograms per cubic meter
[a] Values are shown in ppm (No data available for the number of days standard is exceeded)

Table 3.5-3. Ambient Air Quality at Chula Vista Monitoring Station (1999 – 2003)

Pollutant	Year				
	1999	2000	2001	2002	2003
Ozone (1-Hour)					
Federal/State 1-hour standard (0.12 ppm/0.09 ppm)	0.105	0.091	0.102	0.115	0.075
Ozone (8-Hour)					
Federal 8-hour standard (0.08 ppm)[a]	0.080	0.077	0.079	0.073	0.056
Carbon Monoxide					
Federal/State 8-hour average (9.0 ppm/9.0 ppm)	3.043	3.143	4.650	2.614	5.400
Nitrogen Dioxide					
State 1-hour standard (0.25 ppm)	0.100	0.072	0.071	0.093	0.102
Sulfur dioxide					
Federal 24-hour average (0.14 ppm/0.25 ppm)	0.019	0.010	0.014	0.012	0.011
Suspended 10-micron Particulate Matter (PM_{10})					
Federal/State 24-hour average (150 $\mu g/m^3$/50 $\mu g/m^3$)	59	52	64	50	75
State annual average (20 $\mu g/m^3$)	NA	NA	28.6	27.1	27.6

Source: CARB, 2004b, c, d, e, f and g

ppm parts per million
NA Not Available
$\mu g/m^3$ micrograms per cubic meter
[a] No state standard

Local agencies can control neither the source nor the transport of pollutants from outside the basin. SDAPCD policy, therefore, has been to effectively control local sources in order to reduce locally-produced contamination and meet clean air standards.

Ozone (1-Hour)

The SDAB is currently designated a state “serious” nonattainment area (CARB, 2003) for 1-hour ozone concentrations; however, the area is a federal attainment area for 1-hour ozone concentrations in accordance with 40 CFR 81.305. Peak 1-hour ozone concentrations have steadily declined since 1978 (SANDAG, 1994); however, from 1999 to 2003, the SDAB peak 1-hour ozone concentrations have remained consistent. The SDAB exceeded the federal 1-hour ozone standard on 0, 0, 2, 0 and 1 day, respectively, as shown in Table 3.5-1. During the same five years, the state 1-hour ozone standard was exceeded on 27, 24, 29, 15, and 23 days, respectively.

At the Chula Vista monitoring station, the federal 1-hour standard has not been exceeded since 1996. The state 1-hour standard for ozone was exceeded in 1999, 2001, and 2002. The state 1-hour standard for ozone was exceeded on 4, 2, and 1 day, respectively (CARB, 2004b).

Ozone (8-hour)

The SDAB is currently designated a federal nonattainment area for the 8-hour ozone concentration standard. The State of California currently does not have an 8-hour ozone concentration standard. Peak 8-hour ozone concentrations have steadily declined since 1989 (CARB, 2004c) with one anomaly in 1998. However, from 1999 to 2003, the SDAB peak 8-hour ozone concentrations have remained consistent. Over the past five years, the SDAB exceeded the federal 8-hour ozone standard on 17, 16, 17, 13, and 6 days, respectively, as shown in Table 3.5-1.

At the Chula Vista monitoring station, the federal 8-hour standard has not been exceeded since 1996. The state does not have an 8-hour standard for ozone.

Particulates

Particulates within the respirable range (10 microns in size or less) are reported as both an annual average and a 24-hour average. The basin overall is in attainment of the federal standard but has not met the more stringent state standard (CARB, 2003). For reasons influenced by the area’s dry climate and coastal location, the SDAB has special difficulty in developing adequate tactics to meet the state standard for particulates.

Carbon Monoxide, Nitrogen Dioxide and Sulfur Dioxide

The basin is in attainment for carbon monoxide, nitrogen dioxide and sulfur dioxide for state and federal standards (CARB, 2003).

3.5.3 Odors

Odors are regulated under the SDAPCD Regulation IV, Rule 51 (the “nuisance” rule). An odor is considered a nuisance based on the number of complaints received by the SDAPCD.

Complaints of odors result primarily from the perceived intensity of the odor sensation and the frequency of occurrence. People judge the intensity of odors considered unpleasant as higher than those considered pleasant or normal to their environment. The range in olfactory sensitivity in people of normal acuity can vary up to four orders of magnitude relative to measured concentrations. Few odors are attributable to a single compound.

A method of quantitatively assessing odors has been devised by the American Society of Testing Materials (ASTM) in Standard Method D 1391. This method considers how many times an air sample must be diluted with “clean” air before the odor is no longer detectable to an average adult with average odor sensitivity. The number of dilutions needed to reach this threshold level is referred to as a dilution to threshold (D/T) factor. A threshold level of perception for an odor is 2 D/T (two parts of fresh air to one part of odorous air). At this value, approximately 50 percent of people can detect the presence of an odor. The South Coast Air Quality Management District (SCAQMD) uses a value of 10 D/T as a screening threshold for determining significant impacts due to odor (SCAQMD, 1993). The SDAPCD has no comparable threshold level, but uses the SCAQMD value as a guideline. There is no established correlation, however, between odor threshold values and annoyance.

The SBIWTP is in a semi-rural area of the Tijuana River valley surrounded by agricultural and livestock activities, the Coral Gate residential community, and a few isolated residences to the west. Odors detected during previous odor surveys in the area before construction of the SBIWTP were manure odors from a local farm, which measured less than 2 D/T (OS&E, 1990). Since release of the Draft EIS for the SBIWTP, the City of San Diego approved a new residential development (Coral

Gate) for the Tijuana Street site. This approval would add sensitive receptors approximately 1,200 feet northeast of the SBIWTP.

Adjacent to the SBIWTP is the South Bay Water Reclamation Plant (SBWRP), another potential source of odors in the area. Odor control at the SBWRP is an important part of the overall wastewater treatment process. Odor caused primarily by H_2S gas generated at the SBWRP is processed through odor control scrubbers which use a bleach solution spray to neutralize odor-causing sulfide compounds. The scrubbed air passes through carbon filters to remove any additional foul air before being released into the atmosphere.

Although the odor surveys found the ambient odor conditions in the vicinity of the SBIWTP to be acceptable, comments were received at a previous public meeting indicating that the existing odors were unacceptable to local residents. Odors have also been detected by USIBWC personnel at the SBIWTP site.

The SBIWTP underwent an SDAPCD performance certification in April 1997. The certification included testing of the odor control systems in the facilities to determine compliance with the design specifications and SDAPCD performance requirements. The SBIWTP odor control facility performance exceeded the hydrogen sulfide (H_2S) design performance and permit requirements.

The 1999 SEIS included a H_2S and odor study (Malcolm-Pirnie, 1997), which assessed the odor-producing sources within the Tijuana River valley, including the SBIWTP, the buffer area between Mexico and the United States, Stewart's Drain, and the Coral Gate development. The study was conducted by sampling H_2S and by modeling odor production and transport. This study drew several conclusions about odor in the project area:

- The advanced primary SBIWTP was found to be currently operating well within the SDAPCD H_2S permit limit of 42 $\mu g/m^3$ and the City of San Diego's threshold value of 5 odor units (OU) beyond the fenceline.
- The study evaluated other possible odor sources in the area and identified localized odor-generating "hot spots."
- The H_2S results from the border sampling locations were higher over the 7-day sampling period than those at the plant fenceline.

Emissions from Stewart's Drain (east of the SBIWTP) and several areas of standing water were identified as odor sources, emitting a sewage odor. Likewise, strong odors were traced to the intersection of Dairy Mart Road and Camino de la Plaza. Table 3.5-4 summarizes the 7-day sampling period average and peak values of H_2S. Values at the fenceline of the SBIWTP are lower than the average and peak values found at monitoring points established near Stewart's Drain at the United States/Mexico border. This indicates that odor sources other than the SBIWTP are causing higher levels of odor than the SBIWTP. Sampling at the primary sedimentation tanks produced relatively low results (8 to 36 parts per billion), consistent with the quiescent surface of the water.

Table 3.5-4. Summary of Hydrogen Sulfide Results (ppm) Average from 7-Day Sampling Period (10/29/97—11/04/97)

SBIWTP Fenceline		United States/ Mexico Border		Coral Gate Housing		Primary Sedimentation Tanks
Average	Peak	Average	Peak	Average	Peak	
0.012	0.027	0.020	0.043	0.012	0.021	0.017

ppm = parts per million

Source: Malcolm-Pirnie, 1997

An odor control study was conducted in 2002 (Parsons, 2002). The study found that H_2S concentrations at all sampling locations were within SDAPCD limits. Peak measured H_2S levels and concentrations at the plant boundary were also below peak limits prescribed by the SDAPCD.

One odor complaint was filed with the SDAPCD in May 2003 concerning the operation of the SBIWTP. After an inspection was performed, it was determined that the Tijuana River was the source of the odor. The cause of the odors from the Tijuana River was due to the pump station at the United States/Mexico border which had been malfunctioning for five months. This allowed untreated sewer and sewage water from Tijuana to flow into the Tijuana River and estuary. The untreated water was believed to be the source of the odors. This investigation was closed on June 4, 2003 (LaBolle, 2004).

3.5.4 Ambient Air Quality and Odors in Mexico

Mexico has established ambient air quality standards that are similar to the United States for carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, and particulate matter of 10 micrometers or less in diameter (PM_{10}). These standards are provided in Chapter 6.2.9.1 9 (see Table 6.2-8).

Historically, there has been no regular monitoring of air quality for Mexican border cities. However, recently air quality monitors have been installed in Tijuana and other border cities under a cooperative program between Secretaria del Medio Ambiente Recursos Naturales y Pesca (SEMARNAP), USEPA, and CARB. Quality-assured and controlled measurements of air quality are available for 12 monitoring sites along the San Diego/Tijuana border, including four in Tijuana. Air quality is monitored by CARB at two monitoring stations in Tijuana near the border: the Las Playas station to the west, and the Instituto Technologico de Tijuana (ITT) station to the east. Tables 3.5-5 and 3.5-6 summarize the number of days the air quality standards were exceeded during the last seven years at the Las Playas and ITT stations, respectively. Tables 3.5-7 and 3.5-8 compare the annual monitoring data from these two stations in Tijuana with the Mexico ambient air quality for the last seven years. Although there have been days when the federal, state and Mexican air quality standards have been exceeded, data for the past four years is sporadic.

Based on measurements over the last seven years, general conclusions can be drawn about the ambient air quality in Mexico. PM_{10} is a problem in Tijuana with regard to California standards being exceeded. The average emissions in Tijuana exceed emissions in San Diego for most pollutants. Possible sources of PM_{10} in Mexico could be unpaved roads, agricultural activities, and uncontrolled emissions during construction.

Table 3.5-5. Number of Days Air Quality Standards Were Exceeded at Tijuana Las Playas Monitoring Station (1997 – 2003)

Pollutant	Year						
	1997	1998	1999	2000	2001	2002	2003
Ozone (1-Hour)							
Federal 1-hour standard (0.12 ppm, 235 μg/m^3)	0	0	0	NA	NA	NA	NA
State 1-hour standard (0.09 ppm, 180 μg/m^3)	4	0	0	NA	NA	NA	NA
Ozone (8-Hour)							
Federal 8-hour standard (0.08 ppm, 157 μg/m^3)	0	0	0	NA	NA	NA	NA
State 8-hour standard (Not Applicable)	NA	NA	NA	NA	NA	NA	NA
Carbon Monoxide							
Federal 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	NA	NA	NA	NA
State 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	NA	NA	NA	NA
State 1-hour average (20 ppm, 23 mg/m^3)	0	0	0	NA	NA	NA	NA
Nitrogen Dioxide							
Federal annual average (0.053 ppm, 100 μg/m^3)[a]	0.013	0.013	0.014	NA	NA	NA	NA
State 1-hour standard (0.25 ppm, 470 μg/m^3)	0	0	0	NA	NA	NA	NA
Sulfur Dioxide							
Federal 24-hour average (0.14 ppm, 365 μg/m^3)	0	0	0	NA	NA	NA	NA
State 1-hour average (0.25 ppm, 655 μg/m^3)	0	0	0	NA	NA	NA	NA
State 24-hour average (0.04 ppm, 105 μg/m^3)	0	0	0	NA	NA	NA	NA
Suspended 10-micron Particulate Matter (PM_{10})							
Federal 24-hour average (150 μg/m^3)[b]	0	0	0	0	0	0	NA
State 24-hour average (50 μg/m^3)[b]	14	NA	NA	10	13	10	NA

Source: CARB, 2004a

ppm parts per million
mg/m^3 milligrams per cubic meter
μg/m^3 micrograms per cubic meter
[a] Data shown in ppm (No data available for the number of days standard is exceeded)
[b] Sampled Days Exceeding Standards

Table 3.5-6. Number of Days Air Quality Standards Were Exceeded at Tijuana ITT Monitoring Station (1997 – 2003)

Pollutant	Year						
	1997	1998	1999	2000	2001	2002	2003
Ozone (1-Hour)							
Federal 1-hour standard (0.12 ppm, 235 μg/m^3)	1	0	0	NA	NA	NA	NA
State 1-hour standard (0.09 ppm, 180 μg/m^3)	7	3	0	NA	NA	NA	NA
Ozone (8-Hour)							
Federal 8-hour standard (0.08 ppm, 157 μg/m^3)	3	0	0	0	0	0	NA
State 8-hour standard (Not Applicable)	NA	NA	NA	NA	NA	NA	NA
Carbon Monoxide							
Federal 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	NA	NA	NA	NA
State 8-hour average (9.0 ppm, 10 mg/m^3)	0	0	0	NA	NA	NA	NA
State 1-hour average (20 ppm, 23 mg/m^3)	0	0	0	NA	NA	NA	NA
Nitrogen Dioxide							
Federal annual average (0.053 ppm, 100 μg/m^3)[a]	0.017	0.019	NA	NA	NA	NA	NA
State 1-hour standard (0.25 ppm, 470 μg/m^3)	0	0	0	NA	NA	NA	NA
Sulfur Dioxide							
Federal 24-hour average (0.14 ppm, 365 μg/m^3)	0	0	0	NA	NA	NA	NA
State 1-hour average (0.25 ppm, 655 μg/m^3)	0	0	0	NA	NA	NA	NA
State 24-hour average (0.04 ppm, 105 μg/m^3)	0	0	0	NA	NA	NA	NA
Suspended 10-micron Particulate Matter (PM_{10})							
Federal 24-hour average (150 μg/m^3)[b]	0	0	0	0	0	0	NA
State 24-hour average (50 μg/m^3)[b]	28	NA	NA	27	26	23	NA

Source: CARB, 2004a

ITT = Instituto Tecnologico de Tijuana
ppm parts per million
mg/m3 milligrams per cubic meter
μg/m3 micrograms per cubic meter
[a] Data shown in ppm
[b] Sampled Days Exceeding Standards

Table 3.5-7. Ambient Air Quality for Tijuana Las Playas Monitoring Station (1997 – 2003)

Pollutant	Year						
	1997	1998	1999	2000	2001	2002	2003
Ozone (1-Hour) Concentration (ppm)							
Mexico 1-hour average (0.11 ppm, 216 µg/m^3)	0.106	0.084	0.079	NA	NA	NA	NA
Carbon Monoxide Concentration (ppm)							
Mexico 8-hour average (11.0 ppm, 13 mg/m^3)	4.975	3.300	3.857	NA	NA	NA	NA
Nitrogen Dioxide Concentration (ppm)							
Mexico 1-hour average (0.21 ppm, 394 µg/m^3)	0.090	0.076	0.089	NA	NA	NA	NA
Sulfur Dioxide Concentration (ppm)							
Mexico 24-hour average (0.13 ppm, 340 µg/m^3)	0.014	0.012	0.016	NA	NA	NA	NA
Suspended 10-micron particulate matter (PM_{10}) Concentration (ppm)							
Mexico 24-hour average (150 µg/m^3)	97	120	106	111	113	124	NA
Mexico annual average (50 µg/m^3)	41.9	NA	NA	NA	40.5	39.6	NA
Source: CARB, 2004a							

Table 3.5-8. Ambient Air Quality for Tijuana ITT Monitoring Station (1997 – 2003)

Pollutant	Year						
	1997	1998	1999	2000	2001	2002	2003
Ozone (1-Hour) Concentration (ppm)							
Mexico 1-hour average (0.11 ppm, 216 µg/m^3)	0.133	0.124	0.087	NA	NA	NA	NA
Carbon Monoxide Concentration (ppm)							
Mexico 8-hour average (11.0 ppm, 13 mg/m^3)	4.275	6.043	4.875	NA	NA	NA	NA
Nitrogen Dioxide Concentration (ppm)							
Mexico 1-hour average (0.21 ppm, 394 µg/m^3)	0.116	0.114	0.098	NA	NA	NA	NA
Sulfur Dioxide Concentration (ppm)							
Mexico 24-hour average (0.13 ppm, 340 µg/m^3)	0.017	0.014	0.008	NA	NA	NA	NA
Suspended 10-micron particulate matter (PM_{10}) Concentration (ppm)							
Mexico 24-hour average (150 µg/m^3)	133	105	141	119	131	92	NA
Mexico annual average (50 µg/m^3)	52.6	NA	NA	51.4	49.6	NA	NA
Source: CARB, 2004a							

Odor sources in Tijuana have not been substantiated by testing. Potential sources of odors in the vicinity of the SBIWTP and former Hofer site are PS1, surface drainages, and vehicular emissions on International Avenue and other roads. PS1 handles average flows of about 38 mgd of untreated sewage and is not equipped with odor control scrubbers. Surface drains may contain stormwater, sewage, and other sources of water that will create odors if allowed to stagnate. The distance from the SBIWTP to the border is 300 feet.

The distance of the SBIWTP to residential areas in Mexico is about 600 feet. The low hydrogen sulfide levels detected at the SBIWTP fenceline and the low odor levels predicted by the model suggest that odors from the SBIWTP are not an existing nuisance or concern.

3.6 NOISE

This subchapter presents noise terminology, affected noise environment, and ambient noise conditions in the project area.

The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel (dB), a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for describing levels of sound.

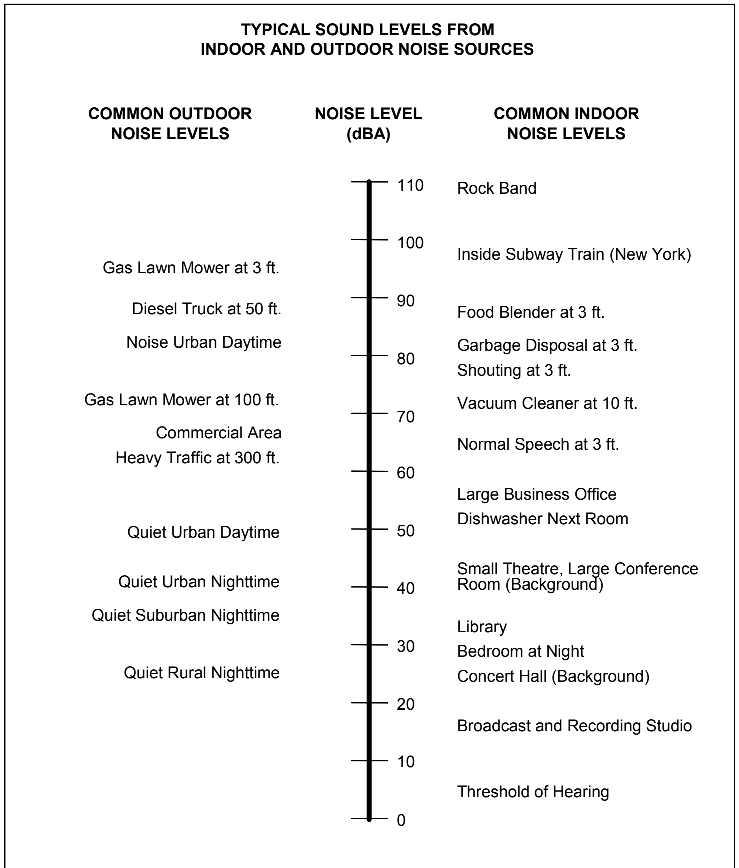
Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting and expressed as dBA, has been devised to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI S1.4 1983), are applied to the frequency content of the sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 3.6-1 depicts typical A-weighted sound pressure levels for various sources. For example, 65 dBA is equivalent to normal speech at a distance of 3 feet.

To characterize the overall noise environmental and analyze community exposure to noise, the averaged sound exposure is expressed in California as the Community Noise Equivalent Level (CNEL). While the USEPA has selected the Day-Night Average Sound Level (DNL) as the uniform descriptor of averaged sound exposure, in practice CNEL and DNL are often used interchangeably. Noise at a specific location is described as the equivalent sound level (L_{eq}).

3.6.1 Ambient Noise at the SBIWTP

In the United States, the predominant land uses in the immediate vicinity of the SBIWTP are an inactive quarry, agricultural pastureland and residential. The Coral Gate housing area (a planned residential community) is located approximately 1,200 feet northeast of the SBIWTP. The nearest school is Willow Elementary School, approximately 1.1 mile northeast of the facility.

Ambient noise measurements were taken in 1991 and 1992 before construction of the SBIWTP, as discussed in the 1994 Final EIS (RECON, 1994a). In September 1991, the 24-hour average noise level measured at the northwest corner of the site was 50.6 dBA L_{eq}. The 1-hour averages during this time ranged from 42.7 dBA L_{eq} at midnight to 58.6 dBA L_{eq} at 9:00 AM. The dominant noise sources during the 24-hour measurement were traffic on Monument Road, helicopter and jet overflights, and radio-controlled model airplanes. During January 1992, noise was measured at the same location for a continuous 2-week period. The average for the 2-week period was 53.5 dBA L_{eq}. The daily averages during this time period ranged from 48.4 dBA L_{eq} to 59.8 dBA L_{eq}.



Source: Parsons

Figure 3.6-1. Typical A-Weighted Noise Levels

The 1996 South Bay Reclamation Plant and Dairy Mart Road and Bridge Improvements EIR/EA included noise measurements taken 50 feet north of the intersection of the Dairy Mart Road centerline near the Monument Road intersection. The 24-hour CNEL measured at this location was 67 dBA, and the peak hour L_{eq} was 70 dBA. The main source of noise was attributed to vehicle traffic, including construction vehicles to and from the SBIWTP site and equipment at the site. Since those noise measurements were taken, the SBIWTP has been constructed and operated on a limited basis. Although noise measurements have not been taken, operation of the SBIWTP was projected to increase ambient noise levels to 67 dBA L_{eq} at 50 feet from the source during full operation for primary treatment. This is considered a noise level that is compatible with the surrounding agricultural and livestock land use (RECON, 1996b).

Motor vehicle traffic is another source of noise near busy intersections and during morning and afternoon commute times. These noise levels are consistent with expected levels for moderately-sized suburban residential developments. Noise from operations of the SBIWTP is not perceptible in the Coral Gate residential area.

3.6.2 Future Noise Conditions in the Project Area

Future noise levels in the border region would not be expected to change as a result of future projects that may be constructed. Under planned noise levels, all existing residential areas would be expected to continue to experience ambient noise below 65 dB.

3.7 LAND USE

This subchapter characterizes the land uses in the vicinity of locations where project facilities would be located or where those facilities could cause impacts. This discussion includes a description of the existing and planned residential, agricultural, extractive, recreational, and military uses in the Tijuana River Valley community in the United States, as well as international border operations. A general discussion of land uses in Tijuana, Baja Mexico is also included.

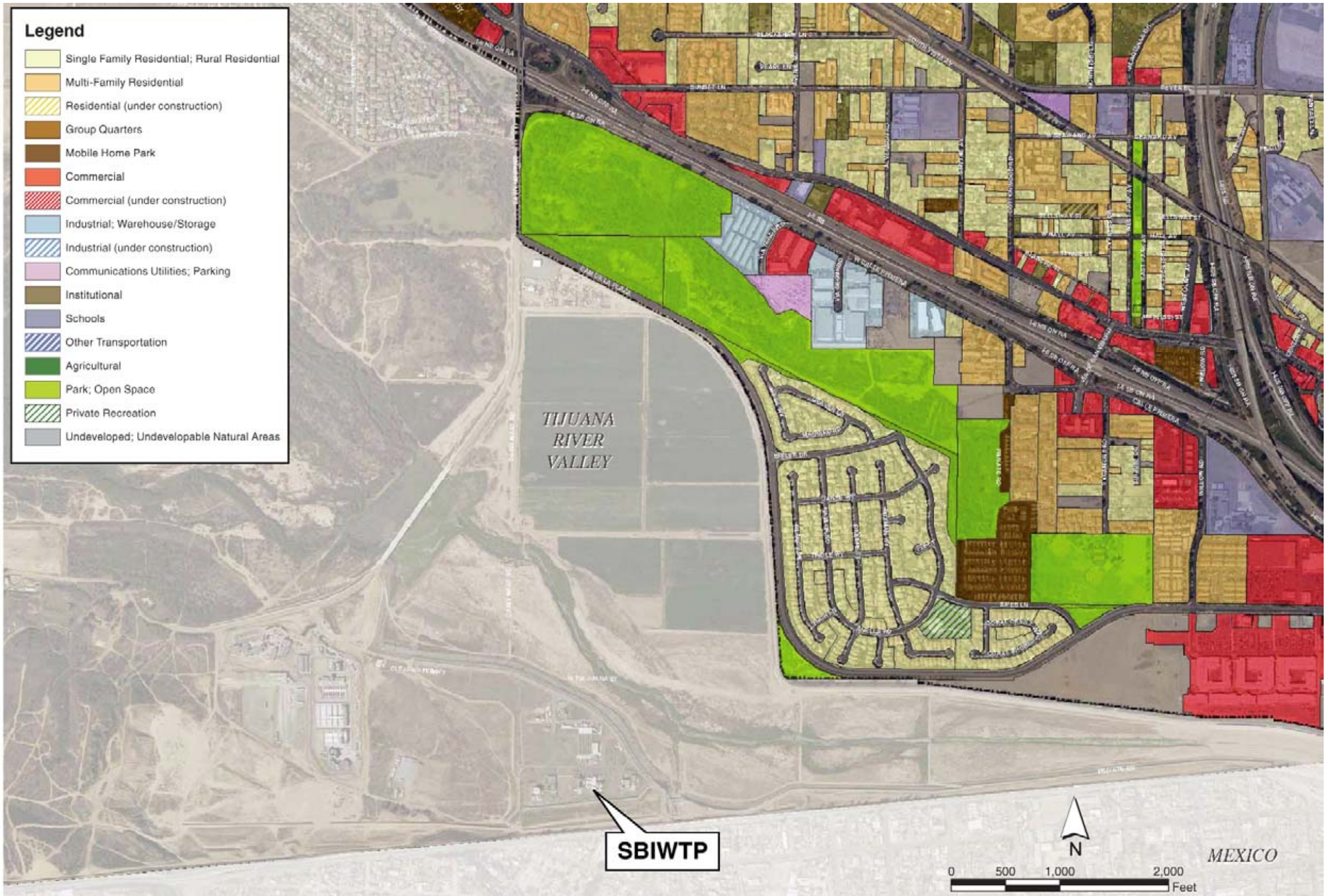
Specifically, the affected areas would include:

- The vicinity of the SBIWTP, the SBWRP, the former Hofer site; and,
- Public Law 106-457 (Public Law 106-457) alternative facilities (i.e., pipelines, pump stations and treatment plant sites)

3.7.1 Existing Land Uses in the Tijuana River Valley

The SBIWTP is located within the Tijuana River valley, along the United States/Mexico border near the entrance of the Tijuana River into the United States. It is bounded on the east and north by the river floodplain, on the south by the municipality of Tijuana, and on the west by the SBWRP and an inactive sand and gravel quarry in the Border Highlands area.

The Tijuana River valley is characterized by rural, sparsely populated land with land uses primarily limited to agriculture and recreational uses, as well as uses dedicated to natural resource preservation. Agricultural uses in the river valley include fields for row crops, sod farms, horse breeding ranches, and stables. With the exception of the Coral Gate residential community, home sites are scattered sparsely throughout the valley. Near the western end of the Tijuana River valley is the Tijuana River National Estuarine Research Reserve, a salt-marsh estuary south of the Imperial Beach Naval Air Station. South of the reserve is Border Field State Park, an area of natural wetland habitat, separated from the ocean by a wide sand beach. The County of San Diego's Tijuana Valley Regional Park is located west of the SBIWTP. Immediately adjacent to the southern edge of the valley lies the municipality of Tijuana, Baja California, Mexico. The City of Imperial Beach and the unincorporated community of Nestor are located approximately 2.2 miles north of the international border. Along the eastern/northeastern edge of the valley lies the San Diego community of San Ysidro. Existing land use in the vicinity of the SBIWTP is shown on Figure 3.7-1.



Source: City of San Diego, 2003e

Figure 3.7-1. Existing Land Use in the Project Area

3.7.1.1 Residential Uses and Population

The Tijuana River valley contains the Coral Gate residential community and otherwise rural, sparsely scattered dwellings including single-family homes and private ranches. According to the 2000 U.S. Census Bureau, 41 percent of the area's residents are Caucasian and roughly 41 percent are of Hispanic origin (SANDAG, 2000b). The San Diego Association of Governments (SANDAG) has estimated the 2004 population within the Tijuana River Valley Community Planning Area at 62 (SANDAG, 2004). Population growth is expected to be minimal and reach 63 by 2030 (SANDAG, 2000c). An estimated 19 housing units (2004 base) are within the area. These residences have an average of 3.3 persons per household (SANDAG, 2004).

The residential area closest to the SBIWTP site is approximately 1,200 feet northeast of the site.

3.7.1.2 Agricultural Uses

The Tijuana River valley is characterized by agricultural development with a diverse array of agricultural operations represented. Row cropping, organic sprouts production, and horse breeding and boarding have been the primary agricultural uses in this area.

3.7.1.3 Extractive Uses

Another land use in the Tijuana River valley is sand and gravel extractive operations. The Tijuana River valley has had extensive sand and gravel extraction operations in the past. Sand mining had been ongoing in the river until flooding occurred in 1993. The area known as Border Highlands, south of Monument Road and east of Border Field State Park, had been home to extraction operations in the past.

In compliance with the Surface Mining and Reclamation Act of 1975, the deposits have been mapped as Mineral Resource Zone (MRZ) 2. MRZ-2 represents areas where adequate information indicates that significant mineral aggregate deposits are present, or where it is judged that a high likelihood for their presence exists.

3.7.1.4 Recreational Uses

Recreational use and preservation of natural coastal resources account for approximately 80 percent of the Tijuana River valley acreage (SANDAG, 2000b). Recreational areas include the Tijuana River Valley Regional Park, Border Field State Park, Tijuana River National Estuarine Sanctuary, Tijuana Slough National Wildlife Refuge, and beach areas. Some smaller recreational areas include the Chula Vista Model Airplane and Radio Control Club and the YMCA Camp Surf in Imperial Beach.

Tijuana River Valley Regional Park

The Tijuana River Valley Regional Park consists of approximately 1,800 acres west of the SBIWTP, of which 1,638 acres are owned by the County of San Diego. Other land uses in the park are under the jurisdiction of the City of San Diego and the California Department of Fish and Game. The park is generally bounded on east by Diary Mart Road (except for a portion of the Dairy Mart ponds that extend further east), the Tijuana River Estuary on the west, the United States/Mexico international border on the south and Sunset Avenue and the residential community to the north. The park includes a mixture of recreational uses, agriculture and native habitats.

Border Field State Park

Border Field State Park is part of the Estuarine Reserve and is located at the westernmost end of the Tijuana River valley, at the southwest corner of the continental United States. This park is one of the few remaining beaches in the United States that allows horseback riding, a popular form of recreation in this park. Other activities include bicycling, hiking/walking, picnicking, and nature viewing. The park is open for day use only. Border Field State Park offers a unique view of the border and the Tijuana bullring, as well as views of the Los Coronados Islands and Playas de Tijuana. No camping is allowed in the park.

Other Recreational Uses

The Chula Vista Model Airplane and Radio Control Club have a relatively small site in the river valley, just west of the SBIWTP, used for flying model airplanes (CVMARC, 2004).

The YMCA Camp Surf is located in North Imperial Beach, just south of Silver Strand State Beach. The camp operates all year and offers summer camp as well as environmental education classes for school children during the spring and fall school seasons. The environmental classes use the beach and the camp offers additional recreational activities such as fishing and surfing in the summer. The YMCA camp, which remains relatively full when open, is dependent on the nearby ocean for its activities.

Equestrian businesses are also located in the valley, including horse rentals, boarding, or breeding. The rental businesses operate all year and use the nearby trails and beaches. Horse riders have access to numerous trails and are allowed on the beaches in the valley vicinity. The valley has 27 miles of trails and trail access to the Otay Mesa area.

3.7.1.5 Military Uses

Navy Outlying Field, Imperial Beach (NOLF-IB) is a U.S. Navy helicopter air station located on 1,100 acres in the northwest portion of the Tijuana River valley, adjacent to Imperial Beach and the estuary. The field is the only exclusive-use Naval helicopter airfield on the west coast (Globalsecurity.org, 2004). Navy Outlying Field, Imperial Beach serves as a practice field for Pacific Fleet helicopters and is utilized by 11 squadrons of combat and patrol helicopters.

3.7.1.6 Border Operations

The international border between the United States and Mexico is 300 feet south of the SBIWTP. A steel border fence has been constructed along the southern boundary of the United States from the ocean to the International Crossing at San Ysidro and eastward. On the United States side, west of the San Ysidro crossing, the area north of the fence is cleared of vegetation and night lighting stanchions have been installed.

The United States Border Patrol is responsible for the interdiction of smuggling, drug traffic and persons attempting to enter the United States illegally. United States

Border Patrol agents from the Imperial Beach station continuously monitor entry across the fenced areas and activity in the river valley by vehicle and aerial patrols.

An additional two sections of fence have been constructed at the border, extending approximately 100 feet north of the old fence. The SBIWTP has a perimeter screen of narrowly-spaced pillars to provide security and restrict access to the plant.

3.7.2 Planned Land Uses in the Tijuana River Valley

3.7.2.1 City of San Diego

Tijuana Estuary and River Valley

The Tijuana River Valley Community Planning Area is within the Coastal Zone. The Coastal Zone Management Program for the area is governed by the California Coastal Act Policies and Plan, Local Coastal Program, and Tijuana River National Estuarine Sanctuary Management Plan. The California Coastal Plan (State of California, 1975a) identifies the coastal area of the Tijuana River valley as Subregion 12 of the San Diego Coast Region. This plan has identified management objectives for this planning area:

- Preserve and protect resource and habitat values and agricultural lands;
- Prevent urban encroachment;
- Complete the acquisition of land and improve in a manner consistent with estuarine preservation; and,
- Retain and restore the estuary to tidal action.

The Tijuana River Valley Plan and Local Coastal Program Addendum (City of San Diego, 1999) addresses the major portion of the Tijuana River valley and provides land use policies and goals for portions of the area within the City of San Diego and coastal zone. The overall goals of the plan are to:

- Provide flood protection;
- protect, preserve and restore natural coastal resources;
- conserve and enhance agricultural productivity;
- provide visual and passive relief from continuous urbanization; and,
- provide necessary public health and safety facilities and services within the public lands portions of the planning area.

The planning area designations in the vicinity of the SBIWTP are shown on Figure 3.7-2. As shown on this diagram, a majority of the planning area is designated for long-term natural open space use (Multiple Species Conservation/Open Space). A smaller area is designated for “Other Community Open Space/Agricultural Use”. Other land use designations are “Military” for the Imperial Beach Naval Air Station at the northern edge of the planning area, and “Utility” for the existing SBIWTP, SBWRP and Hofer sites.

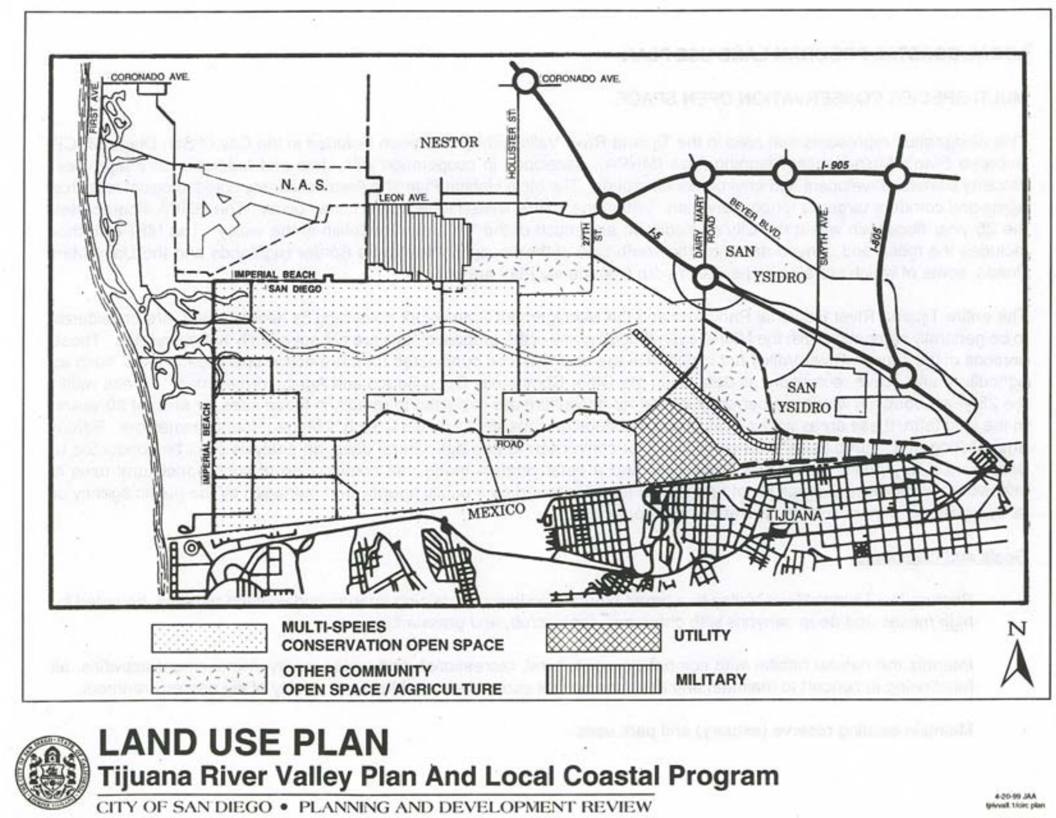


Figure 3.7-2. Planning Area Designations

The specific goals and objectives of the Utility Element are to provide adequate public and private utilities to serve the Tijuana River Valley and surrounding communities and region, while respecting the natural characteristics of the area.

3.7.2.2 Multi-Species Conservation Plan

The City of San Diego and other regional jurisdictions, in cooperation with the United States Fish and Wildlife Service and the California Department of Fish and Game, have prepared an overall Multi-Species Conservation Plan (MSCP) (City of San Diego, 1996) to implement the requirements of the California Natural Communities Conservation Planning Act of 1992 and Section 10a of the Endangered Species Act. The MSCP includes locally specific Subarea Plans for each covered jurisdiction. The Subarea Plan for the City of San Diego identifies the Tijuana River valley and estuary as a preserve area and gives the following specific management policy goals and objectives for the area:

> *The optimum future condition for the Tijuana River Valley is a broad natural floodplain containing riparian and wetland habitats and bounded by high mesas and deep canyons with chaparral, sage scrub, and grasslands. The natural habitat would be intermixed with compatible agricultural, recreational, and water quality improvement activities, all functioning in concert to maintain and enhance natural ecosystems and processes, water quality and*

the full range of native species, and to generally improve the local quality of life and the environment.

3.7.2.3 County of San Diego

Tijuana River Valley Regional Park

The County of San Diego Department of Parks and Recreation (County) has developed the Tijuana River Valley Regional Park, which includes a mixture of recreational activities, sustainable agriculture and native habitats. The focused planning area for the park was adopted by the County Board of Supervisors and encompasses the area west of I-5, east of the Border Field State Park and Tijuana River National Estuarine Research Reserve, south of Imperial Beach.

Development of the park is governed by the County's Management Framework (1989), which contains the conceptual framework for design and management of the park. The primary goal of the Tijuana River Valley Regional Park is agricultural and wildlife preservation; its location provides protection for that portion of the river system which lies within the jurisdiction of the United States.

The County is proposing to implement a Trails and Habitat Enhancement project within the Tijuana River Valley Regional Park (County of San Diego, 2004). This project would include a network of trials to facilitate recreational access and allow for the rehabilitation of degraded and natural habitat within the regional park.

Tijuana River National Estuarine Research Reserve and Tijuana Slough National Wildlife Refuge Tijuana

In 1982, the Tijuana River National Estuarine Research Reserve (NERR) was established by NOAA to protect one of the few remaining large areas of coastal wetland in Southern California. Since 1982, a land acquisition program has been under way for the estuary.

The Tijuana River NERR encompasses approximately 2,531 acres of tidally flushed wetland, riparian, and upland habitats in the western portion of the river valley and shoreline including the Border Field State Park area. These lands are owned and managed cooperatively by the California Department of Parks and Recreation, United States Fish and Wildlife Service, the City of San Diego, the County of San Diego, and the U.S. Navy. The Tijuana River NERR is linked to two federal land preservation networks: the National Estuarine Research Reserve System, administered by the National Oceanic and Atmospheric Administration (NOAA), and the National Wildlife Refuge System (NWRS), administered by the United States Fish and Wildlife Service.

The original Management Plan for the Tijuana River National Estuarine Research Reserve and Comprehensive Management Plan (CMP) for Tijuana Slough NWR was finalized in 1986 and addressed land use concepts, maintenance of environmental quality, natural and cultural resources protection and enhancement, public recreation, research, and sanctuary area management. An updated Management Plan was prepared in July 2000, which covers the period from 1998 to 2003 and refines concepts presented in the original (1986) management plan. The Plan also identifies management issues that have developed since the 1986 document was issued. The Plan strengthens the Reserve's ability to provide stewardship, research, and education, and to meet the Refuge's wildlife purposes. The plan reiterates the

Reserve's commitment to estuarine stewardship, research, and education for local, governmental, scientific, and educational interests (TRNERR, 2000). As a NWRS CMP, this document is a 15-year plan that may be updated in conjunction with future NERR planning updates.

3.8 SOCIOECONOMICS

This subchapter characterizes the population, income, and employment characteristics of the SBIWTP (including the former Hofer site) and surrounding vicinity in comparison to the County of San Diego. This subchapter also describes the current population location, distribution, density, and growth rates.

3.8.1 San Diego County

3.8.1.1 Population

According to data from the 2000 United States Census, the County of San Diego reported a total population of 2,813,833 persons, the majority of whom (approximately 73 percent) are Non-Hispanic.

3.8.1.2 Employment and Income

The 2000 U.S. Census data for the County of San Diego workforce composition by industry, occupation, and worker class for employed persons 16 years and over.

The County employed approximately 1.24 million workers over age 16. The education, health and social services industries employed the great estimated number of workers, followed by the professional, scientific, management, administrative and waste management, retail trade, and manufacturing industries. Within these industries, the majority of workers held management, professional and related occupations and were found to be wage and salary workers in privately owned establishments.

Median household income for San Diego County (reported in 1999 dollars) was $47,067 (U.S. Census Bureau, 2000). Median family income (reported in 1999 dollars) was $53,438. Per capita income was $22,926 (reported in 1999 dollars).

Approximately four (4) percent of the total county households surveyed were reported to be on public assistance income (35,533 of 995,492 households). In addition, approximately nine (9) percent of all families (59,221 of 669,102 families) were reported to be below the poverty level in the 2000 Census (US Census Bureau, 2004b).

3.8.2 Local Area

3.8.2.1 Population

The SBIWTP and its immediate surrounding area are within an area encompassed by Census Tracts 100.09 and 101.09 in the southwestern part of the County of San Diego. This area comprises primarily a sparsely developed and populated rural highland area. According to 2000 United States Census Bureau data, the total population reported for Census Tracts 100.09 and 101.09 consisted of 10,746 persons. Of this total, 73 and 27 percent are Hispanic and Non-Hispanic, respectively.

3.8.2.2 Employment and Income

According to 2000 U.S. Census Bureau data, the County of San Diego reported workforce composition by industry, occupation, and worker class for employed persons 16 years and over living within Census Tracts 100.09 and 101.09. Industries in Census Tracts 100.09 and 101.09 employed approximately 3,800 workers over age 16. The education, health and social services industries employed the greatest estimated number of workers, followed by the retail trade, and manufacturing industries.

Median household income (1999) reported for Census Tracts 100.09 and 101.09 were $26,215 and $54,360, respectively. For Census Tract 100.09, approximately 19 percent of the households surveyed were reported to receive public assistance income, while only 4 percent of households were reported to receive public assistance income in Census Tract 101.09.

In addition, approximately 32 percent of the population surveyed in Census Tract 100.09 and 5 percent of the population in Census Tract 101.09 were reported to be below the poverty level in the 2000 Census (U.S. Census Bureau, 20004b).

3.9 PUBLIC HEALTH AND SAFETY

This subchapter addresses those aspects of existing conditions at the project site that pertain to public health and safety, including the regulatory setting and hazardous materials.

3.9.1 Previous Studies

Previous investigations of physical conditions undertaken on or near the project site are discussed to determine compliance with applicable laws and regulations for protection of public health and safety.

1994 Final Environmental Impact Statement

The 1994 Final EIS (RECON, 1994b) described the contaminated nature of the Tijuana River. This study noted that the Tijuana River is highly contaminated by continuing spills from the Tijuana sewer system and by drainage of sewage from large populated areas within the Tijuana Municipality that are not served by any sewer system. The 1994 Final EIS also noted that the river water was black in color, foulsmelling, and indistinguishable from raw sewage at Dairy Mart Road in 1991. Although this situation has since improved, continuing sewage flows during wet weather pose environmental and health concerns, including vector-borne disease, from potential exposure to hazardous wastes.

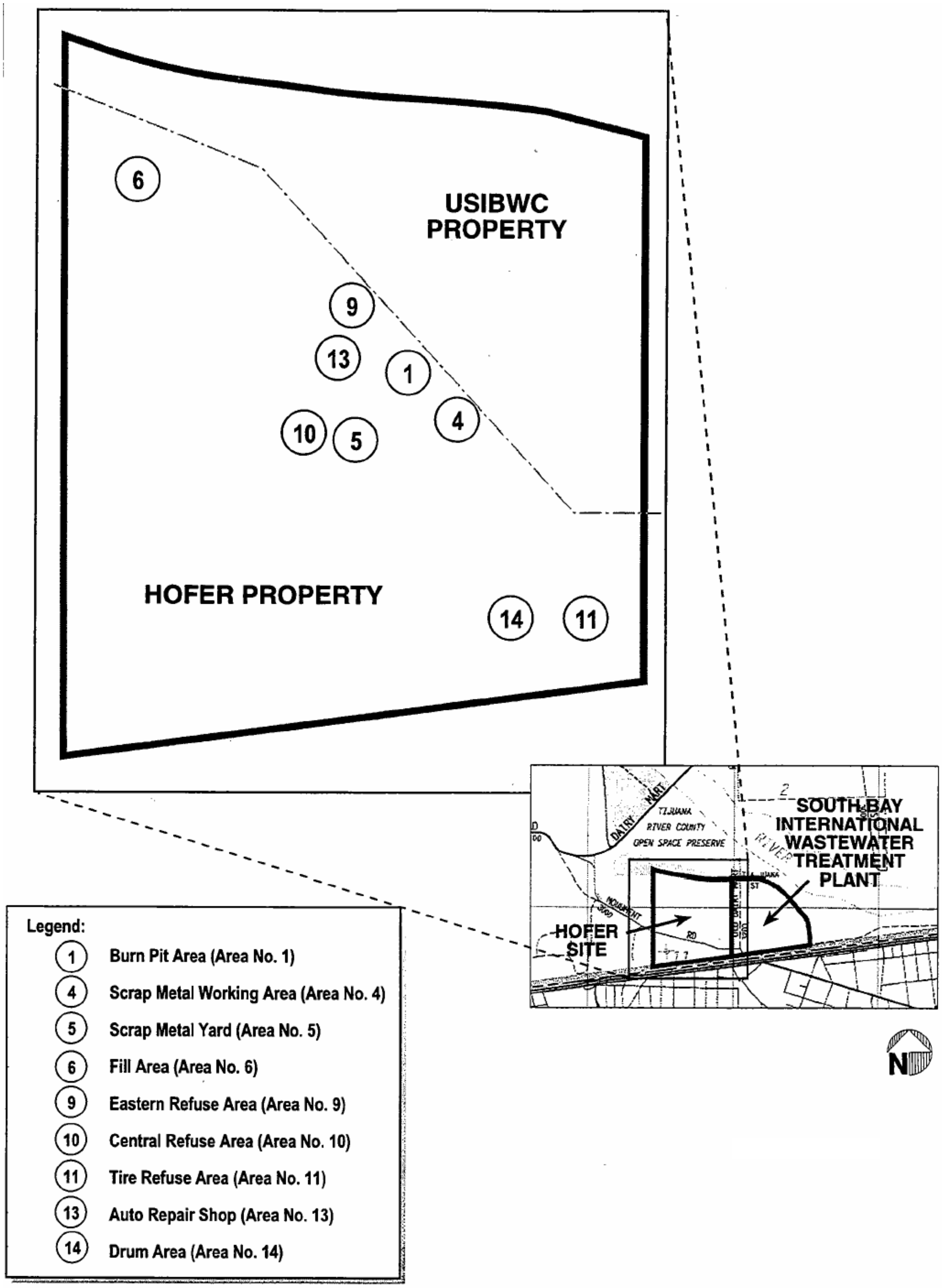
Hofer Property Environmental Site Assessments

1994 and 1997 Phase II ESAs

The former Hofer site historically was used for agriculture (farming and cattle ranching). Purchased by Mr. Hofer in 1957, the property was used as a dairy farm until 1982. Portions of the property were leased for game bird ranching, scrap metal salvage, auto repair, feed storage, and fertilizer processing. In 1997, an Environmental Site Assessment (ESA) was completed for the purpose of evaluating the potential for, and extent of, contamination associated with approximately 43 acres in two parcels, owned by Mr. Julius Hofer and the USIBWC, that were considered for planned future expansion of the SBIWTP (Woodward-Clyde, 1997). Hazardous waste sites reported in the area of the SBIWTP are shown on Figure 3.9-1. A soil sampling program was implemented based on results of previous investigations. Groundwater samples also were collected from five existing wells.

Former uses of the site contaminated the soil in some areas with lead, and in one area with polychlorinated biphenyls (PCB). For this reason, a site assessment was directed by the lead agencies (Woodward-Clyde, 1997). The site assessment characterized the contamination with respect to its location, size, depth, and concentration. Using this assessment, a cost estimate was developed for remediation of the site. In addition to lead and PCBs, a large amount of scrap metal and trash was identified onsite. The 1994 Phase II study (Geofon, 1994) and 1997 ESA investigated various areas on the former Hofer site. The results of these investigations are presented below.

- Burn Pit Area (Area 1) – Contaminants detected above background levels include cadmium, copper, lead, nickel, zinc, total petroleum hydrocarbon (TPH), and PCBs.
- Scrap Metal Working Area (Area 4) – Contaminants detected above background levels include cadmium, copper, lead, mercury, TPH, PCBs, total extractable petroleum hydrocarbon (TEPH), and total volatile petroleum hydrocarbon (TVPH).
- Scrap Metal Yard (Area 5) – Contaminants detected above background levels include cadmium, copper, lead, mercury, TPH, PCBs, and TEPH.
- Fill Area (Area 6) – Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, thallium, zinc, TPH, and TEPH.
- Eastern Refuse Area (Area 9) – Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, vanadium, zinc, TPH, and TEPH.
- Central Refuse Area (Area 10) – Contaminants detected above background levels include cadmium, copper, lead, nickel, selenium, zinc, TVPH, and TEPH.
- Tire Refuse Area (Area 11) – Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, vanadium, zinc, and TPH.
- Auto Repair Shop (Area 13) – Contaminants detected above background levels include antimony, copper, lead, mercury, molybdenum, selenium, zinc, TPH, and benzene, toluene, ethylbenzene and xylene (BTEX).
- Drum Area (Area 14) – Contaminants detected above background levels include antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, zinc, and TPH.



Source: Adapted from Woodward-Clyde, 1997.

Figure 3.9-1. Hazardous Waste Sites Reported in the Project Vicinity

Based on the levels measured, soil contaminants are not above hazardous waste levels and are, therefore, not significant. Groundwater sampling at various locations on the property identified low concentrations of a number of heavy metals (arsenic, barium, molybdenum, vanadium, selenium, silver, and zinc) and VOCs. None of these constituents have been detected at concentration levels above state action levels for drinking water. On the basis of these soil and groundwater samples and analytical results, the ESA reported that none of the samples contained compounds at hazardous concentrations. The following recommendations were made:

- Scrap Metal Working Area (Area 4) – Remediation by removal of 140 cubic yards of soil containing lead and PCBs.
- Scrap Metal Yard (Area 5) – Remediation by removal of 50 cubic yards of soil containing lead.
- Drum Area (Area 14) – Remediation by removal of lead contamination, including excavation, and stockpiling of soil.
- Areas 9, 10, 11, and 13 – Removal and proper disposal of debris (automobiles, parts, tires, construction debris, scrap metal, and industrial debris).

1995 Phase I ESA

In April 1995, a Phase I ESA was conducted in support of the Environmental Impact Report/Environmental Assessment (EIR/EA) prepared for the South Bay Water Reclamation Plant and the Dairy Mart Road and Bridge Improvements project (City of San Diego, 1997). A portion of this ESA focused on the San Ysidro Drum Site, an area of potential contamination west of the SBWRP. This ESA noted that the San Ysidro Drum Site contained a large collection of drums of unknown content and other debris. The reclamation plant EIR/EA indicates that review of County of San Diego Department of Environmental Health files shows that hazardous substances at the site had been properly disposed. This site has since been closed with no further remediation action required. The San Ysidro Drum Site is not listed as a potentially hazardous waste site (EDR, 2004b).

In 1997, contaminated soils at the former Hofer site were removed by the Ecology & Environment, Inc. Superfund Technical Assessment and Response Team. Confirmation sampling of the former Hofer site conducted during and after removal activities indicated that the remaining soils on the site were below USEPA Region IX Preliminary Remediation Goals within the statistical limitation outlined in the Sampling and Analysis Plan (E&E, 1997). Based on this finding, the four monitoring wells and one water production well were removed. Hazardous materials (combustible materials, solvents and lead acid batteries), buried automobiles were removed from the site. Interred soil was tested clean for metals.

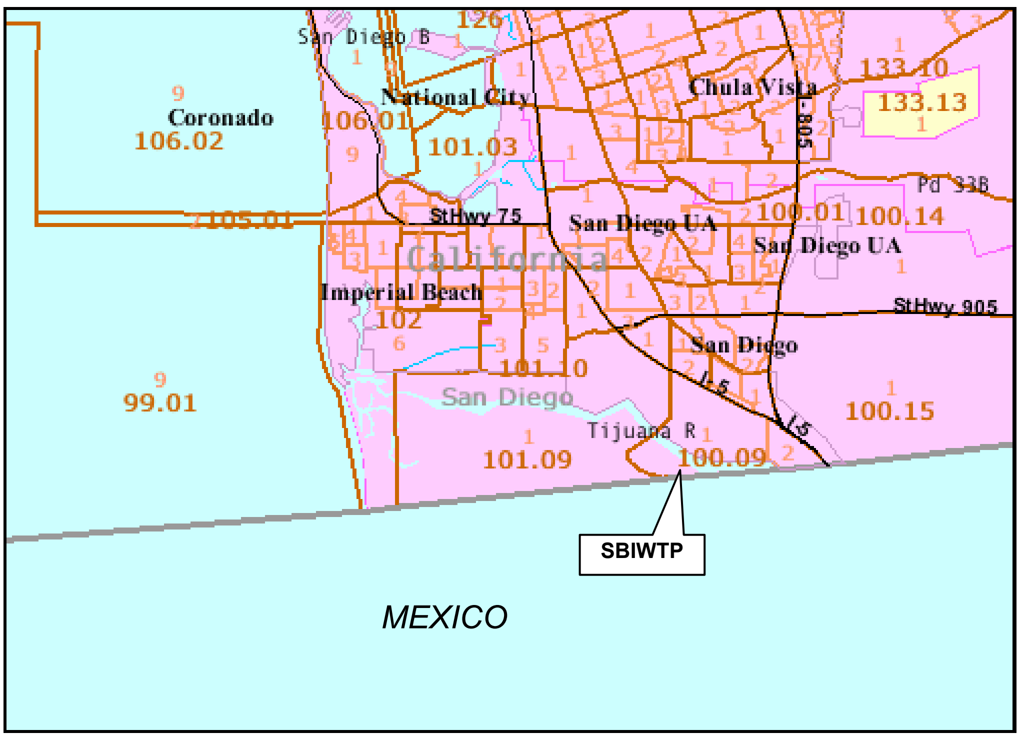
3.10 ENVIRONMENTAL JUSTICE

Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, encourages federal facilities to achieve “environmental justice” by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Accompanying E.O. 12898 was a Presidential transmittal memorandum, which referenced existing federal statutes and regulations to be used in conjunction with

E.O. 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA, specifically that, "Each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC Section 4321, et seq." In this subchapter, relevant data regarding environmental justice is presented, along with an analysis of census tracts that would be affected by treatment and disposal options being considered for Clean Water Act compliance at the SBIWTP.

3.10.1 Demographic Data

An analysis of demographic data was conducted to derive information on the approximate locations of low-income and minority populations in the community of concern. In developing statistics for the 2000 Census of Population and Housing, the U.S. Department of Commerce, Bureau of the Census, identified small subdivisions used to group statistical census data. In metropolitan areas, these subdivisions are known as census tracts. Census tracts in the southern part of San Diego County near the United States/Mexico border are shown on Figure 3.10-1.



Source: U.S. Census Bureau, 2004a

Figure 3.10-1. U.S. Census Tracts in South San Diego County

Since the analysis considers disproportionate impacts, two areas must be defined to facilitate comparison between the area actually affected and a larger regional area that serves as a basis for comparison and includes the area actually affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of this analysis, the community of comparison is San Diego County.

Eight U.S. census tracts were identified in the potential region of influence. The eight U.S. census tracts in the immediate area of the SBIWTP are shown on Figure 3.10-2. In order to determine whether an individual census tract contains a disproportionately high low-income or minority population, data for each tract were compared to data for the community of concern.

Source: U.S. Census Bureau, 2004a

Figure 3.10-2. U.S. Census Tracts in the SBIWTP Area

Minority Populations

Executive Order 12898 defines a minority as an individual belonging to one of the following population groups: Hispanic, Black (not of Hispanic origin), American Indian or Alaskan Native, Asian or Pacific Islander. Under Executive Order 12898, minority populations are to be identified if: (i) the minority population with the affected area exceeds 50 percent; or, (ii) if the minority population age is meaningfully greater than the age in the general population. The percentage of the population represented by minorities and the poverty rate for each of the selected census tracts in the project area are shown on Table 3.10-1.

Census Tracts 101.04, 101.10, 101.12, 100.14, 101.09, 100.09, and 101.15 have a disproportionately high minority population, exceeding 50 percent. Census Tract 102 does not have a disproportionately high minority population. The average minority population of the eight census tracts is 74.8 percent. The minority population in the region of comparison is 42.2 percent.

Table 3.10-1. Percentage of Minority Populations and Poverty Rates in the Project Area

	California	San Diego County	Census Tract								Average
			102	101.04	101.10	101.12	100.14	101.09	100.09	101.15	
White[a]	46.7	55.0	59.0	44.0	19.4	14.5	29.8	11.8	4.6	4.0	23.4
Hispanic or Latino (of any race)	32.4	26.7	27.1	33.5	48.2	69.2	34.7	56.7	86.7	94.2	56.3
Black	6.7	5.7	5.1	2.9	4.0	8.5	27.9	5.3	3.8	0.6	7.3
Asian[b]	10.9	8.9	3.9	14.5	25	5.9	6.3	23.0	3.9	0.8	10.4
American Indian[c]	1.0	0.9	1.4	0.9	0.6	0.9	0.3	0.5	0.8	1.1	0.8
Total Minority	51.0	42.2	37.5	51.8	77.8	84.5	69.2	85.5	95.2	96.7	74.8
Poverty[d]	14.2	12.4	21.9	6.9	10.5	22.9	0.0	5.4	31.6	28.7	16.0

Source: U.S. Census Bureau, 2004a

[a] White persons, not of Hispanic or Latino origin

[b] Asian includes Pacific Islander and Non-Native Hawaiian

[c] American Indian includes Alaska Native persons

[d] Poverty rates reflect persons living below the poverty level (1999)

Minority populations of Hispanic nationality dominate in the potential region of influence with an average of 53.6 percent. The population of Hispanic persons in Census Tract 100.09 is exceptionally high at 86.7 percent. Table 3.10-2 provides a summary of the percent minority and low-income populations for each of the census tracts in the project area.

Table 3.10-2. Summary of Minority and Low-Income Populations in the Project Area

Location	Percent Minority	Disproportionate	Percent Low-Income	Disproportionate
United States	29.4%	--	12.4%	--
California	51.0%	--	14.2%	--
San Diego County	42.2%	--	12.4%	--
Census Tracts in the project area (San Diego County)				
102	37.5%	No	21.9%	Yes
101.04	51.8%	Yes	6.9%	No
101.10	77.8%	Yes	10.5%	No
101.12	84.5%	Yes	22.9%	Yes
101.14	69.2%	Yes	0.0%	No
101.09	85.5%	Yes	5.4%	No
100.09	95.2%	Yes	31.6%	Yes
100.15	96.7%	Yes	28.7%	Yes
Average	74.8%	Yes	16.0%	Yes

Source: U.S. Census Bureau, 2004a

Poverty Rates

The United States Census Bureau poverty assessment weighs income before taxes and excludes capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). Poverty rates indicate low-income populations are relatively high within Census Tracts 100.09, 101.12, and 102 (U.S. Census Bureau, 2004). The average low-income population is 16.0 percent for the region of influence. The percentage of persons living below the poverty level in the region of influence is greater than the 12.4 percent in the region of comparison. The project area exhibits a disproportionately high population of persons with low income in relation to the community of comparison and region.

3.11 ENERGY CONSUMPTION

The affected energy environment includes existing consumption patterns associated with the operation of the SBIWTP. The primary energy resources of concern are fossil fuels, electricity, and natural gas.

On June 3, 1999, Executive Order 13123, *Greening the Government Through Efficiency in Energy Management*, was signed by the President. This law mandates the Federal Government, as the largest energy consumer, to significantly improve its energy management to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change. This law requires the Federal Government to lead the Nation in energy efficient building design, construction and operation in addition to the promotion of energy efficiency, water conservation and the use of renewable energy products as part of effective energy management.

3.11.1 Fossil Fuels

As with other regions in California, virtually all consumption of fossil fuel (gasoline and diesel) in San Diego takes place in the transportation sector. Information from the San Diego Association of Governments (SANDAG) indicates that, in 1990, transportation-related gasoline and diesel consumption within the San Diego region totaled approximately 877 and 77 million gallons, respectively (SANDAG, 2000a). During this period, gasoline- and diesel-fueled vehicles traveled an average of approximately 50.4 million miles per day. SANDAG projects total regional vehicle gasoline and diesel consumption to be approximately 922 and 89 million gallons per year, respectively, by the year 2010.

3.11.2 Electricity and Natural Gas

Most of the electrical energy and natural gas for the San Diego County area is supplied by San Diego Gas and Electric (SDG&E). In 2002, 16,684 gigawatt-hours (GW-hrs) were consumed in the San Diego region. Total projected sales for the year 2005 are estimated to be 18,444 GW-hrs. In 2002, the electrical demand for the San Diego region was approximately 4,290 megawatts (MW). Forecasts indicate the peak demand in the year 2030 could almost double the demand in 2002, increasing by more than 4,000 MW, bringing the total demand in 2030 to approximately 8,300 MW. SDG&E currently produces approximately 55 percent of the region's total annual peak demand, with 45 percent of the electrical energy from imported power (SDREO, 2003).

The natural gas demand within the San Diego region has been growing by approximately 1.5 to 2.5 percent per year. The growth rate is expected to decline slightly to a 1.2 to 1.6 percent increase per year after 2006. The demand for natural gas was approximately 1,423 million therms in 2002. The demand is expected to grow to approximately 2,032 million therms in 2030 (SDREO, 2003).

CHAPTER 4 – ENVIRONMENTAL CONSEQUENCES

This chapter addresses the direct, indirect and cumulative effects of the No Action Alternative and the six treatment and discharge alternatives as they affect the 11 environmental resource areas. Some of these resource issues were raised during the scoping and consultation process. This chapter is organized by environmental resource and provides the scientific, analytical, and technical basis for assessing the effects on those resources.

Direct and indirect impacts are those that occur within the San Diego area. These impacts would occur over an approximately 20-year implementation period. While some effects are negative or adverse, the long-term effects are beneficial for certain environmental resources.

Environmental impacts are considered significant if one or more of the evaluation criteria for the specific resource would be violated. Evaluation criteria were identified for each environmental resource area to assess potential effects of each treatment or discharge alternative. Evaluation criteria were selected by the USIBWC and take into consideration the issues discussed during the public scoping and alternatives formulation process.

For each of the resource areas evaluated, the following sequence of presentation is used:

- Resource and evaluation criteria (standards of significance); and,
- Discussion of impacts by individual alternative.

Cumulative impacts occur when the USIBWC action has an incremental impact when analyzed in light of "past, present, and reasonable foreseeable future actions regardless who causes or is responsible for such actions." The USIBWC actions under consideration are unique and confined locally to the San Diego-Tijuana area.

Most of the other actions are planning actions that may influence environmental conditions in the project area. These actions have been considered from a general perspective. Planning functions such as conservation areas managed by other regulatory agencies were considered as ongoing actions in the project area. Potential cumulative effects associated with other planned projects in the area are presented in Subchapter 4.12 following the resources impact analysis.

When impacts to a specific resource area are determined to be potentially significant, mitigation measures will be required. Mitigation has been identified in Chapter 5 by individual resource area.

4.1 WATER RESOURCES

This subchapter evaluates potential impacts of the alternatives on water resources. The analysis focused on the major concern identified during SEIS scoping, potential water quality degradation in the South Bay and Tijuana River as a result of increased wastewater flows from the City of Tijuana, and changes under consideration for modified wastewater treatment levels and effluent routing.

For the SBOO outfall discharge the key objective is long-term compliance with requirements of the 2001 California Ocean Plan. The regulatory framework and requirements of the California Ocean Plan are described in detail in Section 6.1.1.4 of the SEIS. California Ocean Plan objectives were also used to assess potential effects on aquatic life at the international border as a result of wastewater releases from Punta Bandera, Baja California. Freshwater quality standards were used to assess effects of Tijuana River dry-weather flows crossing the international border.

Potential water quality in the South Bay was evaluated in the *Shore and Ocean Discharge Modeling Report* prepared in support of the Clean Water Act Compliance SEIS (Parsons 2004). An assessment of ecological risk, provided in Appendix E, was also prepared in support of the SEIS.

The *Shore and Ocean Discharge Modeling Report* evaluated the transport wastewater from the Punta Bandera discharge, and expected bacterial concentrations at the United States/Mexico border, and throughout the South Bay. Results were based on calculated dilution factors derived from a 5-year simulation period, and estimated rates of bacterial degradation (Parsons, 2004: Appendix F). These results were used as the basis to assess potential compliance of the alternatives with the California Ocean Plan in terms of human health protection.

Expected dilution factors for conservative parameters from modeling results were also used in the ecological risk assessment to evaluate water quality at the international border in terms of protection of marine aquatic life (Appendix E). In the risk assessment, exposure concentrations for 14 parameters were calculated for each individual alternative on the basis of dilution factors, and compared with water quality objectives of the California Ocean Plan. Dilutions were calculated using the water background concentrations specified in the California Ocean Plan (3 µg/L for arsenic, 2 µg/L for copper, 0.0005 µg/L for mercury, 0.16 µg/L for silver, and 8 µg/L for zinc).

4.1.1 Standards of Significance

Impacts on water quality for a given alternative were considered significant when calculated concentrations of indicator parameters exceeded regulatory values, either objectives of the 2001 California Ocean Plan for protection of human health and aquatic life, or federal freshwater quality criteria for the Tijuana River. For sediments in the SBOO vicinity, reference values for low-effect levels were used.

Total coliform bacteria was selected as the key indicator parameter for potential impacts on human health. The applicable water quality objective specifies that samples of water at any sampling station shall have a density of total coliform organisms less than 1,000 per 100 mL, provided that this value is exceeded no more than 20 percent of the samples in any sampling location, in any 30-day period, and no samples exceed 10,000 per 100 mL.

For Punta Bandera discharges, the potential to meet water quality objectives was evaluated at coastal monitoring Station S04, located at the United States/Mexico border. Table 4.1-1, obtained from the *2004 Shore and Ocean Discharge Modeling Report* (Parsons 2004), summarizes results of the total coliform bacteria evaluation for discharge conditions in 2004, 2009 and 2023. Results are listed for summer and early fall conditions when the lowest dilution potential occurs. The potential of Punta Bandera discharges to meet the coliform bacteria objective at the international border is presented in three categories:

1. The total colifom bacteria objective would be meet, without exceedances (exceedance potential=0);
2. The objective would be met with a low probability of exceedance that would fall within the allowable value of 20 percent of the samples in a 30-day period (exceedance potential<0.20); and
3. The objective would not be met under the discharge conditions evaluated (high exceedance potential).

Multiple water quality objectives were selected as indicator of potential impacts on marine aquatic life, as listed in Table B of the California Ocean Plan. Indicator parameters included ten metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc), cyanide, non-chlorinated phenolic compounds, ammonia, and total hexachlorocyclohexane (HCH). The basis for parameter selection and detailed expected concentration calculations are presented in Appendix E. For SBOO discharges, compliance was evaluated at the edge of the allowable 1:100 mixing zone. The potential to meet water quality objectives at the international border due to Punta Bandera discharges was also evaluated at coastal monitoring Station S04. Table 4.1-2 lists reference values for water and sediment quality used in the ecological risk assessment (Tables 13 through 18 of Appendix E present potential compliance data discussed herein).

4.1.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

4.1.2.1 Option A: No Future Improvements to Mexico's Conveyance System

Alternative 1 Option A would continue the existing operation of the SBIWTP. The average daily wastewater flow to the SBIWTP would remain at 25 mgd, with treated effluent discharged through the SBOO. Remaining flows would be conveyed to Mexico's San Antonio de los Buenos Wastewater Treatment Plant (SABWWTP) via the Parallel Conveyance Line. While 25 mgd of wastewater would be treated at the SABWWTP, the remainder would be released without treatment at the shoreline at Punta Bandera, 5.6 miles south of the international border. The Punta Bandera discharge is mixed with ocean water in the surf zone by waves and currents, reducing pollutant concentration. Nevertheless, prevailing longshore currents near the international border may carry pollutants northward into the United States. In addition to the discharge at Punta Bandera, it is anticipated that by the year 2023 up to 9 mgd of effluent would be discharged by Mexico into the Tijuana River.

Table 4.1-1. Potential of Punta Bandera Discharges to Meet Total Coliform Bacteria Objective at the International Boundary During Low-Dilution Conditions

Alt.	Description	Year	Flow (mgd)	Conc. ($\times 10^6$ MPN/ 100mL)	Jun	Jul	Aug	Sep
1A	No Action Alternative (Continued SBIWTP Operation as Advanced Primary Facility)	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	40	30.98	Yes, ep<0.001	Yes, ep<0.006	Yes, ep<0.004	Yes, ep<0.001
		2023	50	31.86	Yes, ep<0.001	Yes, ep<0.007	Yes, ep<0.005	Yes, ep<0.001
1B		2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	40	30.98	Yes, ep<0.001	Yes, ep<0.006	Yes, ep<0.004	Yes, ep<0.001
		2023	59	32.4	Yes, ep<0.002	No	No	Yes, ep<0.001
2	Operate SBIWTP as Advanced Primary Facility with Treated Flows Conveyed to Mexico	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	65	29.95	Yes, ep<0.001	No	No	Yes, ep<0.001
		2023	84	31.19	Yes, ep<0.002	No	No	Yes, ep<0.003
3	Operate SBIWTP with City of San Diego Connection	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.001	Yes, ep<0.001	Yes ep=0
		2009	51	30.4	Yes, ep<0.001	Yes, ep<0.001	Yes, ep<0.001	Yes, ep<0.001
		2023	70	31.76	Yes, ep<0.002	No	No	Yes, ep<0.001
4A, 4B, 4C Option I	Public Law 106-457 Facility (Secondary Treatment in Mexico)	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	25	28.32	Yes, ep<0.001	Yes, ep<0.002	Yes, ep<0.002	Yes ep=0
		2023	25	28.32	Yes, ep<0.001	Yes, ep<0.002	Yes, ep<0.002	Yes ep=0
4A, 4B, 4C Option II		2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	65	28.32	Yes, ep<0.001	No	No	Yes, ep<0.001
		2023	84	28.32	Yes, ep<0.002	No	No	Yes, ep<0.002
5A, 5B	Secondary Treatment in U.S. (CMA Ponds/ Activated Sludge)	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	40	30.98	Yes, ep<0.001	Yes, ep<0.006	Yes, ep<0.004	Yes, ep<0.001
		2023	59	32.4	Yes, ep<0.001	No	No	Yes, ep<0.001
6	Secondary Treatment at SBIWTP and in Mexico	2004	31	29.69	Yes, ep<0.001	Yes, ep<0.004	Yes, ep<0.002	Yes ep=0
		2009	25	28.32	Yes, ep<0.001	Yes, ep<0.002	Yes, ep<0.002	Yes ep=0
		2023	25	28.32	Yes, ep<0.001	Yes, ep<0.002	Yes, ep<0.002	Yes ep=0
7	Closure/Shutdown of SBIWTP	2004	56	32.24	Yes, ep<0.001	No	No	Yes, ep<0.001
		2009	65	32.68	Yes, ep<0.002	No	No	Yes, ep<0.001
		2023	84	33.29	Yes, ep<0.003	No	No	Yes, ep<0.003

Yes, ep=0: Bacterial concentrations in this month would meet California Ocean Plan objective. Exceedance potential is zero.
Yes, ep<0.20: The California Ocean Plan objective would be met with an allowable exceedance potential (less than 20% of the samples).
No: Bacterial concentrations at the international border would not meet the California Ocean Plan objective.

Table 4.1-2. Water and Sediment Quality Reference Values Used in the Assessment of Ecological Risk

	2001 California Ocean Plan[a]		Tijuana River Discharge: Water Quality Criteria[b]		SBOO Solids Deposition: Sediment Quality Criteria[c]	
	6-Month Median (μg/L)	Daily Maximum (μg/L)	Acute Exposure (μg/L)	Chronic Exposure (μg/L)	Effects Range Low (mg/kg)	Effects Range Median (mg/kg)
Arsenic	8	32	360	190	8.2	70
Cadmium	1	4	3.9	1.1	1.2	9.6
Chromium	2	8	16	11	81	370
Copper	3	12	18	12	34	270
Lead	2	8	82	3.2	46.7	218
Mercury	0.04	0.16	2.4	N/A	0.15	0.71
Nickel	5	20	1400	160	20.9	51.6
Selenium	15	60	20	5	4	N/A
Silver	0.7	2.8	4.1	N/A	1	3.7
Zinc	20	80	120	110	150	410
Cyanide	1	4	22	5.2	N/A	N/A
Non-Chlorinated Phenolic Compounds	30	120	N/A	N/A	N/A	N/A
Ammonia (as N)	600	2400	-	-	N/A	N/A
Total HCH (Lindane)	0.004	0.008	2	0.08	N/A	N/A

N/A Not available.
[a] Table B, objectives for protection of marine aquatic life.
[b] USEPA water quality criteria for protection of freshwater biota. Ammonia criteria is pH and temperature dependent, and was not included in the risk assessment.
[c] Effects levels from Long et al. (1995). Selenium value is a No Observed Adverse Effect Level from EPA (1996).

Tijuana River

Dry-Weather Flows

All dry-weather flows from the Tijuana River are currently diverted at the international border for subsequent treatment at the SBIWTP and/or SABWWTP. Alternative 1 Option A is the only scenario considered in which direct wastewater discharges into the Tijuana River and estuary would eventually take place during dry-weather conditions. It is estimated that by 2023, up to 9 mgd of untreated sewage from Tijuana would drain into the river unless the conveyance channel capacity is increased to route the wastewater to Punta Bandera. Untreated wastewater flowing south of the international border would exceed most water quality criteria for protection of freshwater aquatic life, both under acute and chronic exposure of aquatic organisms (Appendix E, Table 16). This water quality impact is considered significant because the western Tijuana River valley is designated as the Tijuana River National Estuarine Research Reserve, established by the National Oceanic and Atmospheric Administration to protect one of the few remaining large areas of coastal wetland in southern California.

Wet-Weather Flows

While Tijuana River flows during dry-weather conditions are currently intercepted at the international boundary, stream flows during storm events are allowed to continue into the Tijuana estuary. Wet-weather flows include contaminated runoff from areas not currently served by Tijuana's wastewater collection system, overflows from an aging sewer system, and partially-treated wastewater from the City of Tecate. Future improvements in storm flows are expected by the increased coverage of the Tijuana sewer system and upgrades to the Tecate wastewater treatment system. Adverse impacts, however, are expected by continued sewer overflows and runoff originating from rapidly-expanding unsewered areas. Alternative 1 Option A will not modify existing contamination potential of the Tijuana Estuary during storm events.

Groundwater Recharge

Recharge potential and water quality of the Lower Tijuana River aquifer would no be significantly modified under Alternative 1 Option A. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Some improvements in groundwater quality could result from the increased coverage of the Tijuana sewer system, and water quality improvements in the Tijuana River tributary basins. Overall, current aquifer conditions are likely to continue in the future in terms of both, aquifer recharge and water quality.

SBOO Discharge

Human Health Protection

Under Alternative 1 Option A, compliance with SBOO discharge objectives for total coliform bacteria is anticipated for current, 2009 and 2023 conditions. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the discharge through the SBOO would achieve a median initial dilution that would vary between 193 and 199 to 1 (Parsons, 2004). On the basis of estimated total coliform bacteria, impacts on water quality from the SBOO discharge would not be considered significant from a human health protection perspective.

In addition to bacterial concentrations, the California Ocean Plan (Table B) lists human health protection objectives for 20 noncarcinogen, and 42 carcinogen compounds. Potential compliance with these objectives for the SBOO discharge was previously evaluated in the assessment of Long Term Treatment Options of the SBIWTP (CH2M Hill, 1998a). Based on a 1995-1996 wastewater characterization data, this study concluded that the advanced primary effluent would meet objectives for noncarcinogen substances based on the permitted 1:100 dilution (CH2M Hill, 1998a: Appendix C). Compliance with objectives for most carcinogens was also anticipated for most substances, with the potential exceptions of DDT and PAHs. The significance of these potential exceedances is uncertain because their calculated concentrations included multiple non-detected values represented by the analytical detection limit (CH2M Hill, 1998a: Appendix C).

Compliance with bacterial objectives in the SBOO receiving waters was recently assessed based on 1995-2002 data of the ongoing monitoring program (SAIC, 2004). For simple sample limits, the analysis found a range of compliance values for coliform bacteria from highest (low out of compliance percentages) in the offshore-nearshore stations to the lowest along the shoreline (mean values from 2 to 18 percent). This finding suggested that over-limit bacterial concentrations were associated primarily with land sources, such as river and stormwater outflow, rather than the SBOO offshore discharge (SAIC, 2004).

For the 30-day, 60-day, and six-month objectives for total and fecal coliform bacteria, the monitoring data indicated lower out-of-compliance percentages for the northernmost shoreline stations, and no obvious differences in compliance between pre- and post-discharge periods (SAIC, 2004). This was in contrast with shoreline enterococcus results that showed improved compliance during the discharge period. Generally, the highest out of compliance values were at stations adjacent to and south of the river.

Aquatic Life Protection

Under current, 2009 and 2023 conditions, compliance with most SBOO effluent quality objectives is anticipated for California Ocean Plan parameters for protection of marine biota. Based on minimum calculated dilutions, aquatic organisms would not be at risk from exposure to most metals, cyanide, non-chlorinated phenolic compounds, or total HCH at the edge of the SBOO allowable 1:100 dilution zone (Appendix E, Table 13). These findings are consistent with the 1998 ecological risk evaluation developed for the SBIWTP treatment and discharge options (CH2M Hill, 1998: Appendix D). The current discharge of advanced primary effluent also complies with the outfall's NPDES permit limits for pH (6.0 to 9.0 pH range), oil and grease limits (25 mg/L for monthly average and 40 mg/L for weekly average), and total chlorine residual (0.2 mg/L for 6-month median concentration, and 0.81 mg/L of daily maximum concentration). Future compliance with total chlorine residual in the advanced primary effluent is anticipated for Alternative 1 Option A, as this is an operational parameter whose concentration is controlled by the treatment facility.

While complying with multiple effluent quality objectives, the advanced primary effluent does exceed a number of NPDES permit discharge limits. A recent compliance evaluation of the SBOO effluent, based on 1999 to 2002 data, reported exceedances for the following parameters (SAIC, 2004):

- Chronic exceedances of carbonaceous biological oxygen demand (CBOD) concentrations, total suspended solids, and toxicity (both acute and toxic values).
- High percent exceedances of ammonia prior to March 2002 (88% of the 6-month median concentration);
- Episodical exceedances of copper (10% of the 6-month median concentration); and
- Potential exceedances of dioxins (up to 36% based on 30-day average limit for all TCDD congeners combined). The reliability of reported concentrations and detection frequency was considered uncertain as exceedances may have been due to reporting errors.

A toxicity identification evaluation conducted in 1998 for the SBIWTP effluent identified surfactants as the main source of toxicity; ammonia, zinc, and the pesticides diazinon and carbofuran were also identified as additional toxicants in the effluent (CDM, 2003). It is anticipated that under Alternative 1 (both Options A and B) toxicity of the primary effluent will continue to exceed allowable values unless additional treatment is provided, and/or toxicants are controlled at the source under an industrial pretreatment program. Due to exceedance of NPDES requirements, impacts of Alternative 1 Option A on marine aquatic biota are considered significant under current and future conditions.

Effluent Solids

The current SBOO discharge has NPDES permitted values of 45 mg/L and 30 mg/L for weekly and monthly average concentrations of total suspended solids, respectively. The discharge of primary effluent, applicable to current and future conditions under Alternative 1 Option A exceeds NPDES permitted values. The rate of accumulation, however, is not considered likely to have significant effects on benthic communities by direct burial or reduced oxygen diffusion. The estimated depositional rate was reported in the 1 mm/yr to 2.4 mm/yr range, the same magnitude as the natural sedimentation rate for the South Bay (CDM, 2003).

In terms of chemical composition, solids deposition from the outfall would exceed reference sediment quality values for 3 of 10 metals evaluated (Appendix E, Table 14). Adverse effects are not likely to extend beyond the immediate outfall vicinity as documented by the SBOO long-term monitoring program (City of San Diego, 2000, 2001, 2002 and 2003d).

Punta Bandera Discharge

Human Health Protection

Based on modeling results, Alternative 1 Option A would meet the California Ocean Plan objective of 1,000 total coliform bacteria per 100 mL at the international border (coastal Station S04). Findings of the *Shore and Ocean Discharge Modeling Report* for current, 2009 and 2023 conditions were previously presented in Table 4.1-1. Some exceedances are anticipated, but they would have a low probability of occurrence that falls within the allowable limit under the California Ocean Plan (no more than 20 percent of the samples exceeding 1,000 per 100 mL in any 30-day period). The highest probability to exceed total coliform objectives occurs during July and August, when relatively high waves from subtropical storms from Mexico cause a faster transport to the north of the discharged wastefield. Impacts of Alternative 1 Option A, on human health are not considered significant because exceedances have a low probability that falls within the allowable regulatory limit.

Aquatic Life Protection

In terms of protection of marine aquatic life, Alternative 1 Option A has a potential to exceed some objectives of the California Ocean Plan under the 2009 and 2023 scenarios (Appendix E, Tables 15 and 16). For 2009 conditions at coastal Station S04 in the international border, a 40 mgd Punta Bandera discharge would marginally exceeded the ammonia daily average concentration objective (Appendix E, Table 15). This exceedance would occur under the lowest monthly dilution. Concentrations of other parameters evaluated would not be exceeded. The potential to exceed water quality objectives would increase in the year 2023 as the Punta Bandera coastal discharge reaches 50 mgd. Of 14 water quality indicator parameters evaluated, copper and ammonia objectives could be exceeded on the basis of daily average concentrations, and copper and nickel on the basis of daily maximum concentrations (Appendix E, Table 16). Because there is a potential to exceed water quality objectives, impacts on aquatic life at the international border are considered significant.

4.1.2.2 Option B: With Future Improvements to Mexico's Conveyance System

Alternative 1 Option B would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. The average daily wastewater flow to the SBIWTP would remain 25 mgd. Remaining flows would be conveyed to Mexico's SABWWTP via the improved and expanded original open air conveyance channel. Up to 25 mgd would be treated at the SABWWTP, and the remainder would be released without treatment at the shoreline at Punta Bandera, 5.6 miles south of the international border. The improved conveyance system would eliminate the untreated sewage flows into the Tijuana River, but increase untreated sewage releases at Punta Bandera that bypass the SABWWTP.

Tijuana River

Alternative 1 Option B would control future dry-weather flows in the Tijuana River and estuary by routing them to treatment facilities. Under this scenario, water quality improvements to the Tijuana River and Tijuana Estuary brought about by routing dry-weather flows to the SBIWTP will continue. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated for Alternative 1 Option B under current, 2009 and 2023 conditions.

The existing contamination potential of the Tijuana Estuary during storm events would not be modified relative to current conditions. Future water quality improvements during wet weather conditions are anticipated by the increased coverage of the Tijuana sewer system and upgrades to the Tecate wastewater treatment plant. Adverse impacts, however, are expected by continued sewer overflows and contaminated runoff originating from the City's rapidly-expanding unsewered areas.

Water quality and recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 1 Option B. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Some improvements in groundwater quality could result from the increased coverage of the Tijuana sewer system, and water quality improvements in tributary basins of the Tijuana River. Dry-weather flows south of the border anticipated for the year 2023, in contrast, would result in reduced quality of the aquifer recharge. Current aquifer conditions are likely to continue in the future in terms of both, aquifer recharge and water quality.

SBOO Discharge

Human Health Protection

Compliance with the California Ocean Plan objectives for total coliform bacteria is anticipated for SBOO discharges under current, 2009 and 2023 conditions. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the discharge through the SBOO would always achieve an initial dilution of at least 100 to 1 for all flows considered (Parsons, 2004). On the basis of estimated total coliform bacteria, impacts on water quality due to the SBOO discharge would not be considered significant from a human health protection perspective. Compliance with objectives for non-carcinogen and carcinogen compounds is also expected, as previously indicated for Alternative 1 Option A.

Aquatic Life Protection

Conditions for Alternative 1 Option B would be identical to those discussed for Option A. Compliance is anticipated with most water quality objectives for protection of marine biota listed in the California Ocean Plan. Based on minimum dilutions, aquatic organisms would not be at risk from exposure to metals other than copper, cyanide, non-chlorinated phenolic compounds, and total HCH. NPDES permit limits for pH, oil and grease, and total chlorine residual are currently met, and compliance is anticipated for 2009 and 2023 conditions.

The advanced primary effluent currently discharged through the SBOO, however, does not meet NPDES permit limits for acute and chronic toxicity, carbonaceous biological oxygen demand (CBOD) concentrations, and total suspended solids, and acute toxicity. Future compliance with those limits is not anticipated under Alternative 1 (both Options A and B). On the basis of California Ocean Plan exceedances, impacts of Alternative 1 Option B under current and future conditions are considered significant.

Effluent Solids

Conditions for Alternative 1 Option B would be identical to those discussed for Option A. The current and future discharge of advanced primary effluent through the SBOO under Alternative 1 Option A exceeds NPDES-permitted concentrations for total suspended solids. In terms of chemical composition, solids deposition from the outfall would exceed reference sediment quality values for 3 of 10 metals evaluated (Appendix E, Table 14). Adverse effects are not likely to extend beyond the immediate outfall vicinity as documented by the SBOO long-term monitoring program (City of San Diego, 2000, 2001, 2002 and 2003d).

Punta Bandera Discharge

Human Health Protection

For Alternative 1 Option B, findings of the *Shore and Ocean Discharge Modeling Report* indicate the California Ocean Plan total coliform objective (1000 per 100 mL) would be met at the international border (coastal Station S04) under current and 2009 discharge conditions. Some coliform concentrations could exceed the water quality objective, but the low frequency of occurrence would fall within values allowed by the California Ocean Plan.

For 2023 conditions, the flow increase from 40 mgd to 59 mgd would result in coliform bacteria concentrations that would not meet the water quality objective. Flow increases would be primarily untreated wastewater that bypasses the SABWWTP. The most critical condition would occur during July and August when a faster transport of the discharged wastefield to the north is expected. Impacts of Alternative 1 Option B are considered significant in terms of human health protection due to the potential to exceed the total coliform objectives under 2023 conditions.

Aquatic Life Protection

Alternative 1 Option B would exceed some objectives of the California Ocean Plan for protection of marine aquatic. For a 2009 discharge of 40 mgd at Punta Bandera, the daily average concentration for ammonia at coastal Station S04 at the international border would marginally exceed the water quality objective (Appendix E, Table 15). A greater number of potential exceedances are expected in 2023 when Punta Bandera discharges would increase to 59 mgd. Of 14 water quality indicator parameters evaluated for the 2023 scenario, chromium, copper, ammonia, and total HCH objectives could be exceeded on the basis of daily average concentrations, and copper, nickel and total HCH on the basis of daily maximum concentrations (Appendix E, Table 16). The number of potential exceedances at the international border would be greater under Alternative 1 Option B than under Option A due to the additional 9 mgd of untreated wastewater that would be routed to Punta Bandera. Potential impacts of the alternative in terms of aquatic life protection would be considered significant.

4.1.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would continue current SBIWTP operation and refurbish Tijuana's original conveyance channel to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. An average flow of 25 mgd would continue to receive advanced primary treatment at the SBIWTP, with all effluent returned to Mexico. All other flows would remain in Mexico. Tijuana's wastewater generation would continue to exceed the collection, conveyance and treatment capacity, resulting in the discharge of untreated flows to the shoreline. Up to 25 mgd would be conveyed to the SABWWTP for treatment, and the remainder would be discharged into the shoreline without treatment at Punta Bandera, 5.6 miles south of the international border.

Tijuana River

Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by the routing of wastewater dry-weather flows to the SBIWTP will continue. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated under future conditions for Alternative 2 relative to current conditions (Alternative 1).

The existing contamination potential of the Tijuana Estuary during storm events would not be modified relative to current conditions. Some improvement in water quality is anticipated during wet weather conditions by the increased coverage of the Tijuana sewer system and upgrades to the Tecate wastewater treatment plant. Adverse effects, however, are expected by continued sewer overflows and contaminated runoff originating from the City's rapidly-expanding unsewered areas.

Water quality and recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 2. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Some improvements in groundwater quality could result from the increased coverage of the Tijuana sewer system, and water quality improvements in tributary basins of the Tijuana River. Current aquifer conditions are likely to continue in the future in terms of both, aquifer recharge and water quality.

SBOO Discharge

Discontinued SBOO operation would eliminate the discharge of primary effluent and solids load resulting in beneficial effects in the outfall's area of influence. Compliance with the NPDES permit discharge requirements would no longer be a concern. The contaminant load, however, would be routed to Punta Bandera, increasing potential impacts north of the United States/Mexico border.

Punta Bandera Discharge

Human Health Protection

For the Punta Bandera coastal discharge, total coliform bacteria concentrations at border Station S04 are likely to exceed the California Ocean Plan objectives. As indicated by findings of the *Shore and Ocean Discharge Modeling Report* (Table 4.1-1), total coliform objectives would be exceeded under both, 2009 conditions (65 mgd average flow), and 2023 conditions (84 mgd average flow). The most critical conditions would occur during July and August when relatively high waves from subtropical storms cause a faster transport to the north of the discharged wastefield. Because total coliform bacteria objectives would be exceeded at the international border, Alternative 2 impacts are considered significant in terms of human health protection.

Aquatic Life Protection

At the international border, Alternative 2 would have a greater potential for adverse effects on marine aquatic life than Alternative 1 as a greater number of California Ocean Plan objectives would be exceeded. For 2009 conditions, copper, nickel and ammonia concentrations would exceed objectives for protection of marine aquatic life at coastal Station S04 (Appendix E, Table 15). Conditions would deteriorate further by 2023 with the increase of Punta Bandera discharges to 84 mgd. With the increased discharge, up to 6 indicator parameters would be exceeded, either in terms of daily average or daily maximum concentration: chromium, copper, nickel, cyanide, ammonia, and total HCH (Appendix E, Table 16). Due to these exceedances, potential impacts on marine aquatic life at the international border are considered significant.

4.1.4 Alternative 3 - Operate SBIWTP as Advanced Primary Facility and Convey 14 MGD of SBIWTP's Effluent to City of San Diego Facilities with Remainder of SBIWTP's Effluent Returned to Mexico

Alternative 3 represents an interim option to continue SBIWTP operation at its current capacity of 25 mgd by sending up to 14 mgd of primary effluent to City of San Diego treatment facilities (SBWRP and PLWTP). The remaining 11 mgd of effluent would be returned to Mexico, where it would be mixed with untreated wastewater and discharged into the shoreline at Punta Bandera. Additionally, 25 mgd would continue to be conveyed to Mexico's SABWWTP for treatment. New facilities would be required to convey the screened effluent from the SBIWTP to the SBWRP and to return primary and secondary waste sludge to the SBIWTP's solids handling facilities.

Tijuana River

Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by the routing of wastewater dry-weather flows to the SBIWTP will continue. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated under future conditions for Alternative 3 relative to current conditions (Alternative 1).

As in the case of Alternative 1, existing contamination potential of the Tijuana Estuary during storm events would not be modified. Future water quality improvements during wet weather conditions are anticipated by the increased coverage of the Tijuana sewer system and upgrades to the Tecate wastewater treatment plant. Adverse impacts, however, are expected by continued sewer overflows and contaminated runoff originating from the City's rapidly-expanding unsewered areas.

Water quality and recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 3. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Some improvements in groundwater quality could result from the increased coverage of the Tijuana sewer system, and water quality improvements in tributary basins of the Tijuana River. Current conditions, however, are likely to continue in the future in terms of both, aquifer recharge and water quality.

SBOO Discharge

At the SBOO, the current 25 mgd discharge of primary effluent from the SBIWTP would be discontinued, or replaced by a discharge of up to 5 mgd of secondary effluent from the SBWRP. Under these conditions, the contaminant load in the outfall vicinity would be significantly reduced, and there would be no exceedances of California Ocean Plan objectives. Since the outfall is currently permitted for secondary effluent discharge, compliance with the NPDES permit discharge requirements is expected, both under the 2009 and 2023 scenarios. Beneficial effects in the outfall vicinity are likely due to the elimination or reduction of effluent discharges and solids release relative to current conditions (Alternative 1). The City of San Diego has voiced a concern that SBWRP use to treat SBIWTP primary effluent could adversely affect treatment process and limit potential uses of the reclaimed water.

PLOO Discharge

The NPDES permit for the Point Loma Ocean Outfall authorizes the City of San Diego the discharge of advanced primary treated effluent, as it is considered that the city's effluent does not represent a significant risk to human health or marine aquatic life. The addition of up to 14 mgd of SBIWTP flow to the Point Loma Ocean Outfall is not anticipated to have significant impacts because the combined discharge would match the current discharge treatment level (advanced primary), and flow rates would remain within the outfall's permitted values. Due to the presence of toxicity in the SBIWTP primary effluent, however, water quality of the current City of San Diego discharge could be degraded. The City has voiced a concern that this would hinder current NPDES permit authorization to discharge primary effluent discharge through the outfall. Elimination of toxicants from the SBIWTP effluent would be a requirement for Alternative 3 implementation.

Punta Bandera Discharge

Human Health Protection

Findings of the *Shore and Ocean Discharge Modeling Report* indicate that, under 2009 conditions, Alternative 3 would meet the California Ocean Plan objective for total coliform bacteria at the international border (coastal Station S04). Some coliform concentrations at the international border could exceed the water quality objective, but the low frequency of occurrence would fall within values allowed by the California Ocean Plan (no more than 20 percent of the samples exceeding 1,000 per 100 mL in any 30-day period). The most critical condition would occur during July and August when a faster transport of the discharged wastefield to the north is expected

For 2023 conditions, in contrast, a flow increase from 51 mgd to 70 mgd would result in coliform bacteria concentrations exceeding the California Ocean Plan water quality objective. Flow increases would be the result of untreated wastewater that bypasses the SABWWTP and 11 mgd of SBIWTP primary effluent routed to Punta Bandera. Due to the potential to exceed the total coliform objectives under 2023 conditions, adverse impacts of Alternative 3 are considered significant in terms of human health protection.

Aquatic Life Protection.

Similarly to the two previous alternatives, Alternative 3 has a potential to exceed California Ocean Plan objectives at coastal Station S04 at the United States/Mexico border (Appendix E, Tables 15 and 16). For 2009 conditions, 2 out of 14 indicator parameters for protection of marine aquatic life would be exceeded (chromium and ammonia). The exceedance potential would increase in 2023 as the flow increases to 70 mgd. Up to six indicator parameters would be exceeded, either in terms of daily average or daily maximum concentration: chromium, copper, nickel, cyanide, ammonia, and total HCH (Appendix E, Table 16). Due to these potential exceedances of water quality objectives as a result of Alternative 3, impacts on marine aquatic life at the international border are considered significant.

4.1.5 Alternative 4 - Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three treatment options for implementing Public Law 106-457. These options consider secondary treatment at new facilities in Mexico.

- **Option A** would result in continuation of the existing operation of the SBIWTP with construction of a new secondary treatment plant in Tijuana. At present, the plant location and specific facilities required to implement Public Law 106-457 have not been fully identified.

- **Option B** would result in no further operations at the SBIWTP. Up to 59 mgd of wastewater flows would be conveyed to the Public Law 106-457 facility for secondary treatment. Flows from the City of Tijuana beyond 59 mgd would be retained in Mexico and conveyed to the SABWWTP for treatment. Under this option, a secondary treatment plant with an expanded capacity would be constructed in the Alamar River Basin.

- **Option C** would match the overall concept of Option A, with continued operation of the SBIWTP and 25 mgd of advanced primary treated effluent sent to a secondary treatment facility to be constructed in Tijuana under a private initiative known as the Bajagua Proposal. Up to 34 mgd of raw sewage would be also be pumped to the Bajagua Plant for secondary treatment. All other Tijuana flows would remain within Mexico, with 25 mgd being conveyed to the SABWWTP for treatment.

In terms of water quality impacts, these treatment options are evaluated jointly as any of the new facilities would provide secondary treatment. There are differences, however, in the anticipated routing of the treated effluent under Alternative 4. Effluent discharge options applicable to any of the three treatment options, discussed separately below, are as follows:

- **Discharge Option I** would send all the secondary effluent from the new treatment facilities to the United States for discharge through the SBOO, and
- **Discharge Option II** would route the treated effluent to Punta Bandera for coastal discharge.

4.1.5.1 Discharge Option I: Release of Secondary Effluent through the SBOO

All wastewater generated in Tijuana would receive treatment prior to disposal. Secondary effluent from the new facilities would be routed to the SBOO for discharge in accordance to requirements of the NPDES permit. At the same time, 25 mgd effluent currently treated at the SABWWTP would continue to be discharged at Punta Bandera. It is estimated that flows routed to the SBOO would reach 40 mgd by the year 2009, and up to 59 mgd in 2023.

Tijuana River

Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by the routing of wastewater dry-weather flows to the SBIWTP will continue in the future. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated for 2009 and 2023 conditions for Alternative 4 relative to current conditions (Alternative 1).

The contamination potential of the Tijuana Estuary during storm events would be reduced under Alternative 4 relative to current conditions. As in the case of all alternatives under consideration, future improvements in water quality are anticipated during wet weather conditions by the increased coverage of the Tijuana sewer system and upgrades to the Tecate wastewater treatment plant. Alternative 4, would also reduce sewer overflows reaching the international boundary by placement of treatment facilities in the upper reaches of the watershed. By providing treatment in upstream facilities, sewage transport through the aging collectors of the main Tijuana area would be greatly reduced. The overflow potential would also be reduced by allowing a better use of the hydraulic capacity of existing collectors.

Water quality and recharge potential of the Lower Tijuana River aquifer could also improve under Alternative 4. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Improvements in groundwater quality could be expected from the increased coverage of the Tijuana sewer system and reduction in sewer overflows. Water quality improvements in Tijuana River tributary basins can also be expected by the operation of the Public Law 106-457 treatment facility in the Alamar River Basin, as well as the Japanese-funded wastewater treatment plants scheduled for completion over the next three years. These facilities would produce secondary effluent suitable for direct stream discharge, or aquifer recharge following additional treatment. In combination, these facilities would increase the potential for aquifer recharge, and improved in-stream water quality. Consequently, placement of treatment facilities in the upper Tijuana basin under

Alternative 4 would have beneficial effects on groundwater utilization, and reduce the region's dependency on the Colorado River as primary water source.

SBOO Discharge

Human Health Protection

At the SBOO, compliance with the California Ocean Plan objectives for total coliform bacteria is anticipated. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the discharge through the SBOO would always achieve an initial dilution of at least 100 to 1 for all flows considered. The median initial dilution for the SBOO discharge varies between 193 and 199 to 1. Based on the findings, it was concluded that bacterial concentrations at the shore monitoring stations are not likely to be exceeded under the 2009 and 2023 discharge conditions. Impacts to water quality, from a human health protection perspective, in the vicinity of the SBOO would not be considered significant.

In addition to bacterial concentrations, the California Ocean Plan (Table B) also lists human health protection objectives for 20 noncarcinogens, and 42 carcinogens. Potential compliance with these objectives for discharge of secondary effluent through the SBOO was evaluated in 2003 as part of the environmental review of the Tijuana Water and Wastewater Master Plan (CDM, 2003). This compliance evaluation re-evaluated findings of a previous evaluation performed to assess Long Term Treatment Options of the SBIWTP (CH2M Hill, 1998a). On the basis of 1995-1996 wastewater characterization data, both studies concluded that the secondary treated effluent would meet objectives for noncarcinogen substances based on the permitted 1:100 dilution (CH2M Hill, 1998a: Appendix C; CDM 2003). Compliance with objectives for most carcinogens was also anticipated for most substances, with the potential exceptions of DDT and PAHs. These potential exceedances, however, were not considered significant because their calculated concentrations included multiple non-detected values represented by the analytical detection limit (CH2M Hill, 1998a: Appendix C; CDM 2003). Since the discharge of secondary effluent would meet NPDES permit requirements in terms of water quality, a significant improvement relative to current conditions is expected.

Flow increases from the currently permitted value of 25 mgd, would require modification of the current NPDES permit. A flow increase would not have adverse effects because of the improved effluent quality and the fact that the discharge through the SBOO would always achieve an initial dilution of at least 100 to 1. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the median initial dilution for the SBOO discharge would vary between 193 and 199 to 1 for all flows considered because as the flow increases, so do the number of outfall ports that will be open and discharging (Parsons, 2004).

Aquatic Life Protection

At the SBOO, compliance with California Ocean Plan water quality objectives for protection of marine biota is also anticipated (Appendix E, Table 13). None of the 14 indicator parameters would exceed objectives specified for the edge of the allowable 1:100 dilution zone under either 2009 or 2023 conditions (flows of 40 mgd and 59 mgd, respectively). Likely compliance of the SBOO secondary effluent discharge with California Ocean Plan objectives has also been reported in two previous compliance assessments (CH2M Hill, 1998a and CDM, 2003).

While the current SBIWTP primary effluent does not meet NPDES permit limits for acute and chronic toxicity, significant reduction of effluent toxicity is expected as a result of secondary treatment. A 1998 toxicity identification evaluation of the primary effluent identified surfactants as the main source of toxicity, with potential contributions by ammonia, zinc, and the pesticides diazinon and carbofuran (CDM, 2003). Secondary treatment would significantly reduce the concentration of surfactants, and help reduce the concentrations of pesticides and zinc. California Ocean Plan effluent limits for ammonia would also be achieved.

Likely compliance of the secondary effluent with California Ocean Plan objectives for pH, oil and grease, and dissolved oxygen demand was evaluated in compliance evaluations conducted by CH2M Hill (1998a) and CDM (2003). These studies determined that the SBOO secondary effluent would continue to comply with a 6.0 to 9.0 pH criterion, and oil and grease limits of 25 mg/L for monthly average and 40 mg/L for weekly average. Likely compliance with oxygen demand requirements, evaluated by modeling, indicated that the largest percent reduction in ambient dissolved oxygen levels as a result of the SBOO discharge would not exceed 1.4 percent, well below the 10 percent value specified by the California Ocean Plan (CH2M Hill, 1998a; CDM, 2003).

Effluent Solids

Solids deposition from the outfall would be reduced to 38 percent of current deposition under Alternative 1. Released solids could exceed reference sediment quality values for 3 of 10 metals evaluated (Appendix E, Table 14). Adverse effects are not likely to extend beyond the immediate outfall vicinity as documented by the SBOO long-term monitoring program.

Punta Bandera Discharge

Human Health Protection

In terms of the Punta Bandera coastal discharge, findings of the *Shore and Ocean Discharge Modeling Report* indicate that bacterial concentrations at border Station S04 would meet California Ocean Plan objectives for total coliform bacteria (Table 4.1-1). Occasional exceedances are possible, with a low probability of occurrence that would fall well within allowable values specified by the California Ocean Plan (no more than 20 percent of the samples exceeding 1,000 per 100 mL in any 30-day period). Consequently, impacts are not considered significant in terms of human health protection for the 2004, 2009 and 2023 discharge scenarios. This conclusion differs from previously evaluated Alternatives 1 (Option B), 2 and 3 under which compliance with the California Ocean Plan standard is not expected for 2023 flows during the lowest dilution conditions (Table 4.1-1).

Aquatic Life Protection

Based on the lowest anticipated dilution factors for coastal Station S04 in the international border, none of 14 parameters evaluated would exceed California Ocean Plan objectives under Alternative 4, Discharge Option I (Appendix E, Tables 15 and 16). No significant impacts on marine biota are expected as the Punta Bandera discharge would meet the Plan objectives at the international border under both 2009 and 2023 conditions.

4.1.5.2 Discharge Option II: Discharge of Secondary Effluent at Punta Bandera

All flows from the new secondary treatment facilities would be routed to Punta Bandera, Mexico for disposal. The effluent would be discharged along with 25 mgd of treated effluent currently generated by the SABWWTP. Releases of untreated wastewater would be discontinued.

Tijuana River

Expected conditions would match those previously described under Discharge Option I. During dry-weather conditions, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated conditions as water quality improvements brought about by the routing of dry-weather flows to treatment facilities will continue under the 2009 and 2023 scenarios. The contamination potential of the Tijuana Estuary during storm events would be reduced under Alternative 4 relative to current conditions by the likely reduction of sewer overflows reaching the international boundary. By providing treatment in upstream facilities, sewage transport through the aging collectors of the main Tijuana area would be greatly reduced, and allow a better use of the collectors' hydraulic capacity.

As previously indicated for Discharge Option I, water quality and recharge potential of the Lower Tijuana River aquifer could improve under Alternative 4. Improvements in groundwater quality could be expected from the increased coverage of the Tijuana sewer system and reduction in sewer overflows. Water quality improvements can also be expected in Tijuana River tributary basins by the operation of the Public Law 106-457 treatment facility, as well as the Japanese-funded wastewater treatment plants scheduled for completion over the next three years. These facilities would produce secondary effluent suitable for direct stream discharge, or for aquifer recharge following additional treatment. In combination, these facilities have the potential to increase aquifer recharge, and improve water quality. Consequently, placement of treatment facilities in the upper Tijuana basin under Alternative 4 would have beneficial effects on groundwater utilization, and reduce the region's dependency on the Colorado River as primary water source.

SBOO Discharge

Discontinued SBOO use under Discharge Option II would eliminate the discharge of primary effluent and solids load from treated Tijuana wastewater, with beneficial effects in the outfall's current area of influence. Compliance with the NPDES permit requirements would no longer be a concern, as the discharge would be discontinued. Wastewater previously treated at the SBIWTP would receive secondary treatment for Punta Bandera discharge.

Punta Bandera Discharge

Human Health Protection

For the Punta Bandera coastal discharge, findings of the *Shore and Ocean Discharge Modeling Report* indicate that total coliform bacteria concentrations at the border are not likely to comply with California Ocean Plan objectives (Parsons 2004, Table 5-1). Non-compliance with the total coliform concentration objectives is anticipated for a discharge of 40 mgd of secondary effluent from new treatment facilities in 2009, and a 59 mgd discharge in 2023. These discharges would be discharged in conjunction with 25 mgd of effluent from the SABWWTP. The most critical conditions would occur during the months of July and August when a faster transport to the north of the discharged wastefield is expected. Because of the anticipated exceedance of the California Ocean Plan objective for total coliform bacteria, impacts of Alternative 4, Discharge Option II, are considered significant in terms of human health protection.

Aquatic Life Protection

Under Alternative 4 Discharge Option II, California Ocean Plan objectives for marine aquatic life protection would be met at the international border for 12 out of 14 indicator parameters. For 2009 conditions, daily average concentrations of cyanide and ammonia would exceed plan objectives under critical dilution conditions (Appendix E, Table 15). Regulatory objectives for those two parameters would also be exceeded in 2023 when the anticipated Punta Bandera discharge would increase from 65 mgd to 84 mgd (Appendix E, Table 16). Due to this potential for exceedance, potential impacts on marine aquatic life at the border are considered significant.

4.1.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at SBIWTP. Secondary treatment facilities would be constructed at SBIWTP to treat 25 mgd of wastewater with disposal to the SBOO. This alternative would require Mexico to treat all flows beyond the capacity of the SBIWTP. Within Mexico, flows would be conveyed to the SABWWTP (25 mgd capacity) for discharge of the treated effluent at Punta Bandera. Remaining flows from the City of Tijuana would also be discharged untreated at Punta Bandera. Two treatment options are evaluated separately herein: completely mixed aerated ponds (CMA ponds) and activated sludge systems.

4.1.6.1 Option A - Completely Mixed Aeration (CMA) Ponds at SBIWTP

In addition to the 25 mgd of wastewater treated at the SBIWTP, 25 mgd would be treated at the SABWWTP in Mexico. Wastewater beyond these limits would bypass treatment at the SABWWTP and be released directly at the shoreline at Punta Bandera, where longshore currents would carry untreated sewage northward into the United States.

Tijuana River

Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by the routing of wastewater dry-weather flows to the SBIWTP will continue in the future. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated for 2009 and 2023 conditions for Alternative 5 relative to current conditions (Alternative 1). The existing contamination potential of the Tijuana Estuary during storm events would not be modified relative to current conditions.

Water quality and recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 5. The aquifer has very limited utilization due, among other factors, to extensive saline intrusion. Some improvements in groundwater quality could result from the increased coverage of the Tijuana sewer system, and water quality improvements in tributary basins of the Tijuana River. Current conditions, however, are likely to continue in the future in terms of both, aquifer recharge and water quality.

SBOO Discharge

Human Health Protection

At the SBOO, beneficial effects are anticipated as the current 25 mgd of primary effluent discharge would receive secondary treatment at the SBIWTP. In addition to a significant reduction of coliform bacteria as a result of the additional treatment, the discharge through the SBOO would always achieve an initial dilution of at least 100 to 1.

In addition to bacterial concentrations, the discharge of secondary effluent is also likely to comply with other California Ocean Plan objectives for protection of human health. Previous compliance evaluations have documented that the secondary treated effluent is likely to meet objectives for 20 noncarcinogen, and 42 carcinogen compounds based on the permitted 1:100 dilution (CH2M Hill, 1998a: Appendix C; CDM 2003). The discharge of secondary effluent would meet water quality requirements of the NPDES permit, and represent a substantial improvement relative to current conditions.

Aquatic Life Protection.

At the SBOO, beneficial effects are anticipated as the current 25 mgd primary effluent discharge would receive secondary treatment at the SBIWTP. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the discharge through the SBOO would always achieve an initial dilution of at least 100 to 1. The median initial dilution for the SBOO discharge would vary between 193 and 199 to 1 (Parsons, 2004). Compliance is also anticipated for conventional parameters (e.g. total suspended solids, oil and grease, pH, and oxygen demand), as well as a substantial reduction in effluent toxicity by a decrease in concentrations of surfactants, zinc and pesticides (CDM, 2003).

Effluent Solids

Solids deposition from the outfall would be reduced to approximately 24 percent of current deposition, and meet NPDES permit requirements for total suspended solids. Released solids could exceed reference sediment quality values for 3 of 10 metals evaluated (Appendix E, Table 14). Adverse effects are not likely to extend beyond the immediate outfall vicinity as documented by the SBOO long-term monitoring program.

Punta Bandera Discharge

Human Health Protection

For the coastal discharge at Punta Bandera, findings of the *Shore and Ocean Discharge Modeling Report* indicate that coliform bacteria concentrations at the border are likely to meet California Ocean Plan standards in 2009 but not in 2023 (Table 4.1-1). The most critical conditions would occur during July and August when relatively high waves from subtropical storms cause a faster transport to the north of the discharged wastefield. Because of these potential exceedances, impacts of Alternative 5 Option A are considered significant terms of human health protection.

Aquatic Life Protection

For a Punta Bandera discharge of 40 mgd in 2009, concentrations of 13 out of 14 parameters at coastal Station S04 at the United States/Mexico border would meet California Ocean Plan objectives for marine aquatic life protection. In the single case of ammonia, a marginal exceedance of the water quality objective would occur under the assumption of the lowest monthly dilution, and no degradation of the compound in ocean waters (Appendix E, Table 15). These conditions would significantly deteriorate in 2023 when the Punta Bandera discharge increase to 59 mgd due to the release of untreated wastewater that would bypass the SABWWTP. With the increased discharge, estimated concentrations of five parameters at coastal Station S04 would exceed water quality objectives for marine aquatic life protection: chromium, copper, nickel, ammonia and total HCH (Appendix E, Table 16). Given these potential exceedances, impacts of Alternative 5 on marine aquatic life at the border due to Punta Bandera discharges are considered significant.

4.1.6.2 Option B - Activated Sludge Secondary Treatment

There are two subalternatives for activated sludge treatment in the United States. The effluent quality of both Alternative 5 Option B-1 and Alternative 5 Option B-2 is expected to be the same. Therefore, these subalternatives are evaluated jointly.

In addition to the 25 mgd of wastewater treated at the SBIWTP, 25 mgd would be treated at the SABWWTP in Mexico. Wastewater beyond these limits would bypass treatment at the SABWWTP and be released directly at the shoreline at Punta Bandera, where longshore currents would carry the untreated sewage wastefield northward into the United States.

Tijuana River

Potential effects under Alternative 5 Option B match those previously discussed for Option A. Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur, maintaining improved conditions in the Tijuana Estuary. The existing contamination potential of the Tijuana Estuary during storm events would not be modified relative to current conditions. Water quality and recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 5 Option B relative to current conditions.

SBOO Discharge

Similarly to conditions previously discussed for the CMA pond system, use of an activated sludge system under Alternative 5 Option B would significantly improve effluent quality of the SBIWTP effluent, with beneficial effects in terms of human health and marine aquatic life protection. The discharge would meet current NPDES permit requirements for coliform bacteria as well as California Ocean Plan objectives for 20 noncarcinogen, and 42 carcinogen compounds based on the permitted 1:100 dilution (CH2M Hill, 1998a: Appendix C; CDM 2003). The secondary effluent would also comply with objectives for marine aquatic life protection for selected indicator parameters (Appendix E: Table 13), as well as conventional parameters (total suspended solids, oil and grease, pH, and oxygen demand. A significant reduction in effluent toxicity is also anticipated by a decrease in surfactants, zinc and pesticide concentrations (CDM, 2003).

Effluent Solids

Solids deposition from the outfall would be reduced to approximately 24 percent of current deposition, and meet NPDES permit requirements for total suspended solids. Released solids could exceed reference sediment quality values for 3 of 10 metals evaluated (Appendix E, Table 14). Adverse effects are not likely to extend beyond the immediate outfall vicinity as documented by the SBOO long-term monitoring program.

Punta Bandera Discharge

Human Health Protection

For the coastal discharge at Punta Bandera, conditions for Alternative 5 Option B would match those of Option A, as differences in treatment apply only to the SBOO discharge. Consequently, no exceedances of total coliform concentration objectives is anticipated for 2023 conditions, and impacts of Option B are considered significant terms of human health protection.

Aquatic Life Protection

As in the case of human health protection, anticipated conditions at the international border for Alternative 5 Option B would match those of Option A. For a Punta Bandera discharge of 40 mgd in 2009, concentrations of all parameters with the single exception of ammonia would meet California Ocean Plan objectives at the United States/Mexico border (Appendix E, Table 15). Potential exceedances of California Ocean Plan objectives would occur for five parameters (chromium, copper, nickel, ammonia and total HCH) with the 2023 increase in the Punta Bandera discharge to 59 mgd (Appendix E, Table 16). Given these potential exceedances, impacts on marine aquatic life at the international border due to Punta Bandera discharges are considered significant.

4.1.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would be a combination of Alternatives 4 and 5, implementing secondary treatment both in the United States and in Mexico. This would continue operations of the SBIWTP with secondary treatment facilities, as in Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. With the implementation of Alternative 6, untreated flows into the shoreline at Punta Bandera would be virtually eliminated once the Public Law 106-475 treatment facility commences operation in 2009.

Tijuana River

Under this alternative, dry weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by the routing of wastewater dry-weather flows to the SBIWTP will continue in the future. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated for 2009 and 2023 conditions for Alternative 6 relative to current conditions (Alternative 1).

Similarly to Alternative 4, the contamination potential of the Tijuana Estuary during storm events is likely to be reduced by placement of secondary treatment facilities in Mexico under Alternative 6. Sewer overflows reaching the international boundary would be reduced by placement of treatment facilities in the upper sections of the watershed and reducing sewage transport through the aging collectors of the main Tijuana area. Upstream placement of treatment facilities would also allow a greater utilization of the existing collectors' hydraulic capacity.

As previously indicated for Alternative 4, water quality and recharge potential of the Lower Tijuana River aquifer could also improve under Alternative 6. Improvements in groundwater quality could be expected from the increased coverage of the Tijuana sewer system and reduction in sewer overflows. Water quality improvements can also be expected in Tijuana River tributary basins by the operation of the Public Law 106-457 treatment facility, as well as the Japanese-funded wastewater treatment plants scheduled for completion over the next three years. These facilities would produce secondary effluent suitable for direct stream discharge, or for aquifer recharge following additional treatment. In combination, these facilities have the potential to increase aquifer recharge, and improve water quality. Consequently, placement of treatment facilities in the Tijuana basin under Alternative 6 would have beneficial effects on groundwater utilization, and reduce the region's dependency on the Colorado River as primary water source.

SBOO Discharge

Human Health Protection

At the SBOO, beneficial effects are anticipated as the current 25 mgd of primary effluent discharge would receive secondary treatment at the SBIWTP, and meet water quality requirements of the NPDES discharge permit. The SBIWTP treatment level and SBOO discharge conditions match those previously evaluated under Alternative 5. The discharge of secondary effluent is likely to comply with California Ocean Plan objectives for protection of human health, including coliform bacteria. Previous compliance evaluations have documented that the secondary treated effluent would also meet the objectives of noncarcinogenic and carcinogenic compounds based on the permitted 1:100 dilution (CH2M Hill, 1998a: Appendix C; CDM 2003).

Aquatic Life Protection

At the SBOO, beneficial effects are anticipated as the current 25 mgd primary effluent discharge would receive secondary treatment at the SBIWTP. Findings of the 2004 *Shore and Ocean Discharge Modeling Report* indicate that the median initial dilution for the SBOO discharge would vary between 193 and 199 to 1 (Parsons, 2004). Compliance is also anticipated for conventional parameters (e.g. total suspended solids, oil and grease, pH, and oxygen demand), as well as metals, cyanide, ammonia, non-chlorinated phenols, and total HCH (Appendix E: Table 13). A substantial reduction in effluent toxicity is expected by a decrease in the concentration of surfactants, zinc and pesticides (CDM, 2003). Solids released from the outfall would be reduced to approximately 24 percent of current conditions, and meet NPDES permit requirements for total suspended solids.

Punta Bandera Discharge

Human Health Protection

In terms of the Punta Bandera coastal discharge, findings of the *Shore and Ocean Discharge Modeling Report* (Table 4.1-1) indicate that bacterial concentrations at coastal Station S04 would meet the California Ocean Plan objective for total coliform bacteria. Occasional exceedances are possible, with a low probability of occurrence that would fall well within allowable values specified by the California Ocean Plan (no more than 20 percent of the samples exceeding 1,000 per 100 mL in any 30-day period). Consequently, impacts on human health are not considered significant under either the 2009 or the 2023 discharge scenarios. This matches previously described conditions for Alternative 4, Discharge Option I, and differs from all other alternatives that would not meet California Ocean Plan objectives under 2009 and/or 2023 discharge conditions.

Aquatic Life Protection

Under Alternative 6, concentrations of 14 parameters evaluated at the international border would be below the California Ocean Plan objectives for protection of marine aquatic life (Appendix E, Tables 15 and 16). No adverse impacts on marine biota are anticipated for the Punta Bandera discharge under Alternative 6 under either 2009 or 2023 conditions.

4.1.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in discontinuation of operations at the SBIWTP. Closure of the plant would increase the discharge of untreated wastewater to the shoreline at Punta Bandera from 31 mgd in 2004, to 40 mgd by 2009, and 59 mgd by 2023. Longshore currents would carry untreated sewage northward into the United States, with detrimental effects on seawater quality.

Tijuana River

Under this alternative, dry-weather flows of untreated wastewater into the Tijuana River south of the international border would not occur. Water quality improvements on the Tijuana River and Tijuana Estuary brought about by diversion of dry-weather flows at the international border will continue in the future. For this reason, no adverse effects on the Tijuana River and Tijuana Estuary are anticipated for 2009 and 2023 conditions under Alternative 7 relative to current conditions (Alternative 1).

During storm events, Alternative 7 would have a potential to increase the release of contaminated runoff into the Tijuana Estuary relative to current conditions. Under this alternative, 25 mgd of untreated wastewater currently treated in the SBIWTP would be retained in Tijuana increasing the potential for runoff contamination. Sewer overflow potential would also be increased by reducing the capacity of existing collectors to retain wet weather flows. An increase in runoff contamination reaching the Tijuana River would represent a significant impact on ecosystems of the Tijuana Estuary.

The recharge potential of the Lower Tijuana River aquifer would no be significantly modified under Alternative 7. The increase in contaminated runoff and sewer overflows, however, would have a potential to further degrade groundwater quality.

SBOO Discharge

Discontinued SBIWTP operation would eliminate the discharge of primary effluent and solids load through the SBOO with beneficial effects in the outfall's area of influence. Compliance with the NPDES permit discharge requirements would no longer be a concern. The contaminant load, however, would be routed to Punta Bandera, increasing potential impacts at the shoreline north of the United States/Mexico border.

Punta Bandera Discharge

Human Health Protection

Bacterial concentrations at border Station S04 would exceed the California Ocean Plan standard for total coliform bacteria based on findings of the *Shore and Ocean Discharge Modeling Report* (Table 4.1-1). Conditions would be more critical late summer when a faster northward transport of the discharged wastefield is expected. The potential degradation in water quality conditions would apply not only to the 2009 and 2023 discharge scenarios, but also to 2004 conditions. If SBIWTP operation were discontinued, 25 mgd of wastewater currently treated wastewater from Tijuana would be discharged without treatment at Punta Bandera. Relative to all other alternatives, Alternative 7 would have the most significant and immediate impact in terms of human health protection in the South Bay area.

Aquatic Life Protection

In terms of protection of marine aquatic life, Alternative 7 would have the potential to exceed multiple objectives of the California Ocean Plan at coastal Station S04 in the international border. In 2009, a blend of 25 mgd of treated and 40 mgd of untreated wastewater discharged from Punta Bandera would exceed objectives for six contaminants: cadmium, copper, nickel, cyanide, ammonia and total HCH (Appendix E, Table 15). This is the highest number of potential exceedances for the 2009 discharge scenario under any of the alternatives under consideration. Concentrations of those six contaminants would increase in 2023, along with their potential to exceed water quality objectives, with the increased release of the untreated wastewater discharge from Punta Bandera (Appendix E, Table 16). Because of multiple potential exceedances of water quality objectives, impacts of Alternative 7 on aquatic life at the border and throughout the South Bay are considered significant. In terms of impacts on marine aquatic life, this alternative would have the most significant and immediate impact on water quality along the United States/Mexico border, and into the South Bay, relative to all other alternatives.

4.2 GEOLOGICAL RESOURCES

This subchapter identifies potential geologic impacts of the alternatives, including short-term construction and long-term operation of the treatment options identified for the SBIWTP.

4.2.1 Standards of Significance

In considering the basis for evaluating significance of impacts to geological resources, the degree to which demolition, construction and new operational activities impact subsurface conditions, geologic structures, topography, and surface features were examined. Geological impacts would be considered significant if the project were to:

cause unstable conditions in the earth or change geologic substructures; displace, compact, or overcover the soil; change topography or surface features; or, modify or destroy unique physical features.

4.2.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. No construction would be required. No change to geologic substructures, soils, topography or surface features would result. For these reasons, impacts to geological resources would not occur.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. No construction would be required in the United States. No change to geologic substructures, soils, topography or surface features would result. Impacts to geological resources would not occur.

4.2.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. No construction would be required in the United States. No change to geologic substructures, soils, topography or surface features would result. For these reasons, impacts to geological resources would not be considered significant.

4.2.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP at its current capacity of 25 mgd and conveyance of up to 14 mgd to City of San Diego treatment facilities (SBWRP and PLWTP). Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent back to Mexico. New facilities would be required to convey the screened effluent from the SBIWTP to the SBWRP and to return primary and secondary waste sludge to the SBIWTP solids handling facilities. Construction in the United States would include a new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Because alluvial soils are highly affected by seismic activity (which may take the form of violent shaking or of soil liquefaction), the proposed conveyance system would be susceptible to ground shaking during seismic events. No grading of hillsides would occur. Facilities in the United States would be designed to be seismically-resistant in accordance with the applicable seismic design standards. Recommendations of the geotechnical investigation would be incorporated into design and construction. This alternative would not result in any changes to the geologic substructure or soils. For these reasons, impacts to geological resources would not be considered significant.

4.2.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options for providing implementing Public Law 106-457, as evaluated herein.

4.2.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of a new secondary treatment plant in the Alamar River Basin in Mexico. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would include a new pump station at the SBIWTP site as well as approximately 800 feet of pipeline to transport the advanced primary treated effluent to Mexico and to return the secondary treated effluent from Mexico to the SBOO for discharge (for Discharge Option I). The pump station would be located on the SBIWTP site, west of the primary sedimentation tanks and north of the southwest entrance to the plant. The pump station would include a connection to the discharge piping from the existing SBIWTP. The pump station design would include an integral wet well sized for 1.5 million gallons for pump station operation. It would also provide short-term storage during peak flow periods. The proposed pump station and conveyance system would be susceptible to ground shaking during seismic events. Grading of hillsides for new construction could alter erosion and sedimentation in natural drainage areas. Facilities in the United States would be designed to be seismically-resistant in accordance with the applicable seismic design standards. Recommendations of the geotechnical investigation would be incorporated into design and construction. This alternative would not result in any changes to the geologic substructure or soils. For these reasons, impacts to geologic resources would not be considered significant.

4.2.5.2 Option B: Cease Operation of SBIWTP - Conduct All Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP. Up to 59 mgd of wastewater flows would be conveyed to the Public Law 106-457 facility for secondary treatment. Flows beyond 59 mgd generated by the City of Tijuana would be retained in Mexico and conveyed to the SABWWTP via the PCL for treatment. Under this option, a new secondary treatment plant in the Alamar River Basin in Mexico would be constructed. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would include a new pipeline to transport the secondary treated effluent from the Public Law 106-457 station to the SBOO for discharge (under Discharge Option I).

The proposed conveyance system would be susceptible to ground shaking during seismic events. Grading of hillsides for new construction could alter erosion and sedimentation in natural drainage areas. Facilities in the United States would be designed to be seismically-resistant in accordance with applicable design standards.

Recommendations of the geotechnical investigation would be incorporated into design and construction. This alternative would not result in any changes to the geologic substructure or soils. For these reasons, impacts to geologic resources for either discharge option would not be considered significant.

4.2.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Alternative 4 Option C would result in continuation of the existing operation of the SBIWTP with 25 mgd of advanced primary treated effluent sent to a secondary treatment facility to be constructed in Mexico (Bajagua Plant). All other flows would remain within Mexico, with 25 mgd being conveyed to the SABWWTP via the PCL for treatment. Up to 34 mgd of raw sewage would be pumped to the Public Law 106-457 treatment facility. This alternative would require new facilities in the United States and Mexico. In addition to the Bajagua Plant, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would include a new pump station at the SBIWTP site as well as approximately 800 feet of pipeline to transport the advanced primary treated effluent to Mexico and to return the secondary treated effluent from Mexico to the SBOO for discharge (under Discharge Option I). The pump station would be located on the SBIWTP site, and would include an integral wet well sized for 1.5 million gallons for pump station operation.

The proposed pump station and the conveyance system would be susceptible to ground shaking during seismic events. Facilities in the United States would be designed to be seismically-resistant in accordance with applicable design standards. Recommendations of the geotechnical investigation would be incorporated into design and construction. This alternative would not result in any changes to the geologic substructure or soils. For these reasons, geologic impacts would not be considered significant for either discharge option.

4.2.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at SBIWTP. Secondary treatment facilities (activated sludge or CMA ponds) would be constructed at SBIWTP to treat 25 mgd of wastewater with disposal to the SBOO. This alternative would require Mexico to treat all flows beyond the capacity of the SBIWTP. Within Mexico, flows would be conveyed to the San Antonio de los Buenos Treatment Plant (25 mgd capacity) via the PCL and would be discharged at Punta Bandera. Remaining flows would be discharged untreated at Punta Bandera.

The construction of CMA ponds would result in potential effects on the geologic substructure and soils. Alluvial soils are susceptible to settlement and compaction under load. Ponds or tanks built on compressible soil may shift and develop lining failures as the load of the wastewater compacts the underlying soil. Alluvial soils are also highly affected by seismic activity. This may take the form of violent shaking or of soil liquefaction. In either case, structure damage to buildings, slabs, pond linings and pipelines may occur. The ponds may also be affected by fluctuations in groundwater level, which are common in river estuaries. Any of these events could lead to the escape of wastewater from the ponds or conveyance systems into the groundwater or into the Tijuana River. Facilities in the United States would be designed to be seismically-resistant in accordance with applicable seismic design standards. Recommendations of the geotechnical investigation would be incorporated into design and construction. With incorporation of these design features, impacts to geological resources from the construction of the ponds, pump stations and distribution structures would not be considered significant.

4.2.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. Alternative 6 would require the construction described for in Alternatives 4 and 5. The same impacts on the regional geological resources could be expected. With incorporation of applicable seismic design standards and geotechnical recommendations into design and construction, impacts to geologic resources from the construction of ponds, tanks, pump stations, distribution systems, and other facilities would not be considered significant.

4.2.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP. Geologic impacts would not result because construction would not occur.

4.3 BIOLOGICAL RESOURCES

This subchapter identifies potential biological impacts of the alternatives, including short-term construction and long-term operation of the treatment options identified for the SBIWTP. Biological effects are described in terms of terrestrial, marine and estuarine resources in the United States.

4.3.1 Standards of Significance

Impacts to biological resources would be considered significant if an action would adversely affect a species, its stock or its habitat, if the species is protected by the Endangered Species Act, the Marine Mammal Protection Act, the Migratory Bird Treaty Act, and the California Endangered Species Act. These regulations are described in Subchapter 6.1.2.

NEPA provides guidelines for determining the significance of environmental impacts. The significance criteria used to assess impacts to biological resources were:

- Loss of a critical, yet limited, resource used by a federal or state threatened or endangered species.
- Loss of habitat that is regionally unique, declining, or designated sensitive by resource agencies; and,

- Disturbances to populations or breeding areas of listed threatened or endangered species or reductions in the foraging habitat for threatened or endangered species.

4.3.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

4.3.2.1 Option A: No Future Improvements to Mexico's Conveyance System

This alternative would result in continuation of the existing operation of the SBIWTP. No construction would be required. The terrestrial, estuarine, and marine biological environment at the SBIWTP and affected area would not change from current conditions, with the exception of the year 2023. Lack of improvements to conveyance structures in Mexico would result in eventual discharge of up to 9 mgd of untreated flows into the Tijuana River by 2023 during dry weather conditions.

Terrestrial Biological Resources

Alternative 1 Option A would not require construction of new facilities in the United States or Mexico. Direct or indirect impacts to sensitive biological resources would not occur. Impacts to terrestrial biological resources would not occur.

Estuarine Biological Resources

Alternative 1 Option A would result in a continuation of existing conditions. The lack of improvements to conveyance structures in Mexico would result in eventual discharge of up to 9 mgd of untreated flows into the Tijuana River by 2023 during dry weather conditions. This condition would result in further degradation of habitat conditions in the Tijuana wetlands, which would be considered a significant impact.

Marine Biological Resources

No additional impacts to the offshore benthic community are anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing wastewater discharge has consistently shown no pattern of disturbance relative to the SBOO. Impacts from continuation of existing discharge levels would not be considered significant.

Increasing levels of discharge of untreated effluent at Punta Bandera would likely increase the area of impact and may increase severity of local impact at the site of discharge. Local infaunal[1] communities would be negatively affected; however, impacts to higher trophic level protected species would not be considered significant.

Eventual discharge to the Tijuana River by 2023 would potentially impact infaunal[1] communities of the Tijuana wetlands and nearshore area. This could potentially reduce benthic resources available to resident and migratory bird populations. This could include species protected by the Endangered Species Act or Migratory Bird Treaty Act. Impacts from future untreated discharge into the Tijuana River would be considered significant.

[1] Belonging to the benthic fauna living on the substrate and especially in a soft sea bottom.

4.3.2.2 Option B: With Future Improvements to Mexico's Conveyance System

This alternative would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. Existing biological conditions at the SBIWTP would not change, and construction activities in Mexico would not affect the surrounding community near the SBIWTP.

Terrestrial Biological Resources

Alternative 1 Option B would not require construction in the United States. Direct or indirect impacts to sensitive biological resources in the United States would not occur. Impacts to terrestrial biological resources in Mexico would be limited to previously disturbed areas.

Estuarine Biological Resources

This alternative would result in the rehabilitation of the OCC in Mexico and the resultant elimination of discharge into the Tijuana River by 2023. Estuarine biological resources would benefit from the reduction of dry weather effluent into the Tijuana River. This alternative would result in avoidance of degradation Tijuana River wetlands, which would be considered a beneficial impact.

Marine Biological Resources

No additional impacts to the offshore benthic community would be anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing wastewater discharge has consistently shown no pattern of disturbance relative to the SBOO. Impacts from continuation of existing discharge levels would not be considered significant.

Increasing levels of discharge of untreated effluent at Punta Bandera would be expected to increase the area of impact and may increase severity of local impact at the site of discharge.

Existing conditions and trends would continue unabated, as discharge of advanced primary treated effluent through the SBOO would continue. Current monitoring has detected no discernable effect of SBOO discharge on the surrounding ichthyofauna. This option assumes Mexico would rehabilitate and expand its conveyance systems to allow for the discharge of treated and untreated flows into the coastal Mexican waters at Punta Bandera. Projected total (treated and untreated) Punta Bandera discharge rates would range from 31 mgd in 2004 to 59 mgd by 2023.

4.3.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico.

Terrestrial Biological Resources

Alternative 2 would not require construction in the United States. Loss of terrestrial habitat in the United States would not occur. Direct and indirect impacts to sensitive terrestrial biological resources would not occur.

Estuarine Biological Resources

This alternative would result in elimination of dry weather discharge into the Tijuana River. This would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

No additional impacts to the offshore benthic community are anticipated as a result of this alternative. Current monitoring of the benthic communities in the vicinity of the existing wastewater discharge has consistently shown no pattern of disturbance relative to the SBOO. Since no pattern of disturbance has been found in the area, no changes in benthic community parameters are expected. Impacts from the elimination of existing discharge levels would not be considered significant.

Return of advanced primary treated effluent to Mexico would eliminate the SBIWTP discharge via the SBOO, but increase the discharge of both treated and untreated effluent into the coastal Mexican waters at Punta Bandera. Based on the established baseline by the San Diego MWWD (City of San Diego, 2004b), the reduction in SBOO discharge would cause no significant changes in the fish assemblage in the vicinity of the outfall. The elevated level of discharge, especially untreated effluent, into coastal Mexican waters could potentially harm the standing fish assemblage of the region.

4.3.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to Mexico.

Terrestrial Biological Resources

The new pipelines proposed in Alternative 3 would be placed within the existing paved and dirt roads on the south side of the property and, therefore, are not expected to directly affect sensitive biological resources.

Raptors are not expected to nest in the pepper trees (*Schinus molle* and *S. terebinthifolius*) on the former Hofer site south of Monument Road because these trees are relatively short and highly disturbed. No sensitive plants are known to occur in the proposed path of the pipelines. No direct or indirect impacts to sensitive wildlife or plant species are expected. Impacts to terrestrial biological resources would not be considered significant.

Estuarine Biological Resources

This alternative would result in the continued diversion and treatment of Tijuana River dry weather flows which would avoid degradation of the Tijuana wetlands. This would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

No additional, or reduction in, impacts to the offshore benthic community would be anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions.

Since no pattern of disturbance of the benthic community has been found in the area, improvement of discharge quality and reduction in discharge volume through the SBOO by 2009 would not be expected to result in changes to the local benthic community. Impacts from the improvement and reduction in discharge volume would not be considered significant.

Under Alternative 3, advanced primary treated effluent from the SBIWTP would be transferred to three separate treatment facilities and/or discharge points. All direct discharges of primary effluent from SBIWTP to SBOO would cease, 14 mgd of the treated effluent would be transferred to the City of San Diego's South Bay Water Reclamation Plant and Point Loma Wastewater Treatment Plant, while the remaining 11 mgd would be returned to Mexico. The South Bay plant would provide secondary treatment and discharge through the SBOO, while the Point Loma plant would discharge advanced primary effluent through the PLOO. Monitoring of the ichthyofauna in the vicinity of the PLOO has shown no patterns indicating a negative impact of effluent discharge from the PLOO since it began operating (City of San Diego, 2004c). Elevations in discharge as predicted by Alternative 3 would not be expected to result in a significant threat to local fish assemblages over the current level of discharge.

Alternative 3 allows for continued discharge of untreated wastewater to the nearshore waters of Punta Bandera. Benthic communities would continue to be adversely impacted. The gradually increasing discharge at this location would further impact the ichthyofauna of the area (Dorsey, 1986; Brown et al., 1986).

4.3.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options (A, B and C) for providing implementing Public Law 106-457. The facilities required for the two disposal options (discharge of the treated effluent through the SBOO, and a coastal discharge in Mexico at Punta Bandera) would be constructed within the footprint of facilities required for the treatment options. Implementation of either disposal option would not result in terrestrial biological impacts beyond those identified for the treatment options. Therefore, these impacts are not addressed separately.

4.3.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and pump stations would be constructed in Mexico.

Terrestrial Biological Resources

As shown in Figure 2.2.4-2, a new pump station and effluent pipelines would be constructed on the SBIWTP site. As designed, these features would be placed in ruderal/disturbed habitats and no sensitive biological resources would be directly impacted. There is a potential for least Bell's vireo to occur in the riparian habitat along the Tijuana River. This habitat is greater than 800 feet away from the construction area and indirect noise impacts would not be expected. Impacts to sensitive biological resources in the United States would not be considered significant.

Because a specific site for the construction of a secondary treatment plant in Mexico has not been identified, impacts to terrestrial biological resources were not evaluated although such impacts could include habitat loss.

Estuarine Biological Resources

This option would continue the diversion and treatment of Tijuana River dry weather flows which would avoid degradation of the Tijuana wetlands. This would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

Increased discharge volumes though the SBOO would require opening of more ports along one or both of the discharge legs. While this would increase the area of discharge contact with the benthic environment, local impacts are likely to be similar to those in the vicinity of the current discharge. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions. Impacts to the offshore benthic community as result of continued increase in discharge volume above 25 mgd are anticipated to be similar to current impacts at the PLOO, where differences in community parameters between stations within the influence of the discharge and stations outside of the discharge are found, but the impacted community remains characteristic of natural environmental conditions. While some disturbance is anticipated with increasing discharge, impacts would not be considered significant.

Elimination of discharge of untreated effluent, while maintaining current volumes of treated discharge, at Punta Bandera by 2009 would likely reduce the severity of local impact at the discharge site. This reduction in discharge of untreated effluent would be expected to result in an overall improvement in benthic community parameters in the vicinity of the Punta Bandera discharge. Impacts from the elimination of untreated discharge while maintaining current discharge volumes at Punta Bandera would not be considered significant.

For Alternative 4 Option A with Discharge Option II, the following conditions would occur:

- Increases in discharge volume at Punta Bandera would likely increase the area of impact on the benthic community at Punta Bandera. However, elimination of discharge of untreated effluent at Punta Bandera by 2009 should reduce the severity of the impact at the discharge site.
- While the volume increase is likely to negatively impact local infaunal communities, the impact to higher trophic level, protected species would not be considered significant.
- The direct local discharge of advanced primary treated wastewater via SBOO would cease and the overall volume of discharge from the SBOO would be doubled as secondary treated effluent. The current discharge of advanced primary treated effluent imparts no measurable effect on the localized fish assemblage. Overall improvements in effluent quality accelerated the recovery of kelp forests in Santa Monica Bay (Wilson et al., 1980). Swartz et al. (1986) noted improvements near wastewater discharges in the macrobenthic community of Santa Monica Bay and Palos Verdes Peninsula, California after a large reduction in mass emission from the discharge.

Untreated effluent discharge at Punta Bandera is projected to cease by 2009, with the implementation/operation of a secondary treatment facility in Mexico, thereby allowing for the improvement of localized water quality, ultimately benefiting the coastal ichthyofauna.

4.3.5.2 Option B: Cease Operation of SBIWTP - Conduct All Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of new secondary treatment plant, pipelines and pump stations in Mexico. A new 59 mgd pipeline and pump station to convey treated effluent to Mexico would be constructed in Tijuana. Discharge of effluent via the SBOO would be eliminated.

Terrestrial Biological Resources

Alternative 4 Option B would result in limited loss of terrestrial habitat in previously disturbed areas. Impacts to sensitive terrestrial biological resources in the United States would not be considered significant.

Because a specific site for the construction of a secondary treatment plant in Mexico has not been identified, impacts to terrestrial biological resources were not evaluated although such impacts could include habitat loss.

Estuarine Biological Resources

This option would result in the continued diversion and treatment of Tijuana River dry weather flows, which would avoid degradation of the Tijuana wetlands. This would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

Impacts to benthic communities in the South Bay area, at Punta Bandera and in the Tijuana River would be that same as described for Alternative 4 Option A (Discharge Option II) and would not be considered significant. Untreated effluent discharged at Punta Bandera is projected to cease by 2009, thereby allowing for the improvement of localized water quality, ultimately benefiting the coastal ichthyofauna.

Under this alternative, operations at SBIWTP would cease and all treatment (both primary and secondary) would occur at a secondary treatment plant in Mexico. Option B utilizes limited primary treatment (grit removal and primary sedimentation) prior to secondary treatment and discharge through the SBOO. By 2023 the total effluent discharged from the SBOO would be greater than twice that of current discharge rates. The current discharge of advanced primary treated effluent imparts no measurable effect on the localized fish assemblage. Under this alternative, the discharge of advanced primary treated wastewater would cease and the overall volume of discharge from the SBOO would more than double in the form of secondary treated wastewater. It is unknown what negative impacts a doubling in the volume of discharged effluent, albeit secondary treated, may pose to the surrounding ichthyofauna.

Discharge Option II would result in the discharge of all effluent at Punta Bandera after secondary treatment. This option would cause no significant changes in the fish assemblage surrounding the SBOO based on historical trends in ichthyofauna before and after discharge operations (City of San Diego, 2004b). Untreated effluent discharged at Punta Bandera is projected to cease by 2009, thereby allowing for the improvement of localized water quality, ultimately benefiting the coastal ichthyofauna.

4.3.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Construction of the Bajagua project pump station, portions of the force main and return flow pipeline in the United States would require grading, excavation and possibly compaction over a 6-month period.

Impacts to terrestrial biological impacts associated with Alternative 4 Option C were evaluated in the *Bajagua Project Environmental Impact Document*, prepared by R.W. Beck, February 2004 (R.W. Beck, 2004). Impacts to sensitive biological resources in the United States or to species that migrate to the United States are summarized herein.

Terrestrial Biological Resources

Construction and Operation of Facilities at the SBIWTP Site

Construction of the Bajagua Project pump station and portions of the force main and return flow pipeline within the United States would require grading, excavation and possibly compaction over a 6-month period and cause direct impacts by disturbing approximately 2.5 acres of the SBIWTP site. Because the site has been previously disturbed and does not now support protected species or their habitats, these direct impacts would be less than significant.

Pipelines connecting the SBIWTP and the Bajagua Project treatment plant site would be required for this alternative. Approximately 800 to 1,400 of linear feet of pipe would be constructed in the United States. The construction of these pipelines may impact sensitive biological resources if these pipes are located in and adjacent to the Tijuana River or within non-native grassland habitat. Impacts to sensitive biological resources would be considered significant.

Indirect construction impacts could potentially result to protected species in the vicinity of the SBIWTP site due to construction noise and glare. The least Bell's vireo and coastal California gnatcatcher do not appear to occur in the vicinity. Therefore, significant adverse impacts to protected species from construction noise and glare are not expected. Construction traffic noise, including hauling materials and soil to and from the site, could potentially disturb least Bell's vireos in areas of potential vireo habitat along transportation routes to the site (CH2M Hill, 1999).

The pump station's motors and pump housings would be designed with sound insulation so that ongoing operational nose from the pump station would be less than significant.

Construction and Operation of Facilities at the Bajagua Project Treatment Plant and Pipeline Alignment

Construction and operation of Bajagua Project facilities in Mexico have the potential to adversely affect species that migrate to the United States and that are protected under U.S. law.

Pipeline

Installation of the force main and return-flow pipeline from the United States border would follow the Tijuana River to its confluence with the Alamar River. At the confluence, the pipeline alignment would be constructed under the Tijuana River using a siphon. Direct and indirect construction impacts to protected species in this reach are not expected to be significant because this area is highly developed and previously disturbed. Construction of the pipeline crossing under the Tijuana River is also not expected to result in direct or indirect impacts because the Tijuana River is channelized in this area for flood protection and does not support habitat for protected species.

From the confluence, the force main and return-flow pipeline would be installed in a route running parallel to the south bank of the Alamar River. The western end of the Alamar River is channelized and developed. Therefore, direct and indirect construction impacts in this area are not expected to be significant.

Although not observed, certain areas along portions of the eastern pipeline corridor in Mexico have the potential to support species that migrate to and are federally protected in the United States. Patches of riparian habitat along the pipeline corridor may support the Southwestern willow flycatcher, least Bell's vireo, and arroyo toad, which are listed as endangered.

The arroyo toad does not migrate to the United States. Thus, indirect impacts to terrestrial resources in the United States resulting from any impacts in Mexico to the arroyo toad would not be expected.

Portions of the pipeline corridor could cross riparian habitat. If this habitat supports least Bell's vireo or Southwestern willow flycatcher, direct impacts to the habitat and to those species could result due to loss of habitat. However, the alignment would be adjusted to avoid habitat confirmed to have these species present and the timing of construction could be modified to avoid nesting. Indirect impacts during construction could result from noise, glare, and fugitive dust if construction activities occur during critical life stages or adversely affect the species' habitat. During operation, ongoing impacts would not be expected along the pipeline corridor.

Bajagua Project Treatment Plant Site

Development of the treatment plant site would result in the loss of approximately 113.7 acres of vegetation communities on the 233-acre site. Specifically, construction of the treatment plant would impact 0.6 acres of unvegetated streambed habitat, 33 acres of annual grassland; 1.5 acres of disturbed habitat; 62.6 acres of agricultural habitat, and 16 acres of developed areas (Consultants Collaborative, 2004). The loss in annual grassland habitat could be considered a significant indirect impact in the United States because it provides forage habitat for raptors.

Impacts to unvegetated streambed would not be considered significant because these areas do not drain off-site and because they would not be considered federal wetlands. Riparian areas along the Alamar River could be potentially impacted by runoff and sedimentation during construction. These areas are outside of but adjacent to the Bajagua Project treatment plant site. Petroleum products (fuels, oils, lubricants) and erosion of cleared land during construction could potentially contaminate surface water. Increased runoff from hardscaping or over-irrigation could cause habitats to change.

Estuarine Biological Resources

This alternative would result in the continued diversion and treatment of Tijuana River dry weather flows. This would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

The impacts of Option C on benthic communities would be the same as described for Option A. These impacts would not be considered significant.

The impacts of Option C to fish populations would be the same as described for Option A. Impacts to local ichthyofauna would be considered beneficial.

4.3.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.3.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A would require construction of tanks, thickeners, basin and associated support structures on the 36-acre former Hofer site adjacent to the SBIWTP.

Terrestrial Biological Resources

Alternative 5 Option A would result in construction of new facilities on 36 acres (former Hofer site) adjacent to advanced primary treatment facilities at the SBIWTP. This alternative would result in the loss of approximately 30 acres of disturbed non-native grassland, a sensitive biological resource in the City of San Diego. This would be considered a potentially significant impact.

Estuarine Biological Resources

Alternative 5 Option A would continue the diversion and treatment of Tijuana River dry weather flows. Reduction of dry weather flows would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

No additional impacts to the offshore benthic community would be anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions.

Increasing the discharge of untreated effluent at Punta Bandera would be expected to increase the area of impact and may increase severity of local impact at the site of discharge. Impacts to higher trophic level protected species in the United States would not be considered significant.

Alternative 5 Option A incorporates secondary treatment to advanced primary treated effluent before discharging from the SBOO. The improvement in water quality would not cause a significant change in the localized fish assemblage due to the relatively limited observed impact of the SBOO on the assemblage (City of San Diego, 2004a).

4.3.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) would result in construction of flow equalization facilities and secondary facilities at the SBIWTP. Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity) would result in construction of activated sludge secondary treatment facilities with secondary clarifiers at the SBIWTP.

Terrestrial Biological Resources

Alternative 5 Option B would result in loss of approximately 30 acres of non-native grassland habitat, a sensitive biological resource. Impacts to terrestrial biological resources would be considered significant.

Estuarine Biological Resources

Alternative 5 Options B-1 and B-2 would continue the diversion and treatment of dry weather flows. Control of dry weather flows from the Tijuana River would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

No additional impacts to the offshore benthic community would be anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions.

Options B-1 and B-2 utilize different secondary treatment techniques, but produce effluent of equivalent water quality (19 mg/L BOD and 19 mg/L TSS). Both options would continue to discharge through the SBOO, with the same resulting effect as expected under Alternative 5 Option A. The retention/diversion of overflow raw sewage would be discharged at Punta Bandera with the same impact as Alternative 1 Option B and Alternative 5 Option A. Increasing levels of discharge of untreated effluent at Punta Bandera would increase the area of impact and may increase severity of local impact at the site of discharge.

4.3.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico.

Terrestrial Biological Resources

Alternative 6 would result in loss of approximately 30 acres of non-native grassland habitat in the United States. Impacts to terrestrial biological resources would be considered significant. This alternative would also result in habitat loss in Mexico as a result of construction of secondary treatment facilities.

Estuarine Biological Resources

Alternative 6 would continue the diversion and treatment of Tijuana River dry weather flows. Control of dry weather flows in the Tijuana River would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

Increased discharge volumes through the SBOO would require opening of more ports along one or both of the discharge legs. While this would increase the area of discharge contact with the benthic environment, local impacts are expected to be similar to those in vicinity of the current discharge. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions (City of San Diego, 2000-2004a). Impacts to the offshore benthic community as a result of continued increase in discharge volume above 25 mgd are anticipated to be similar to current impacts at the PLOO, where differences in community parameters between stations within the influence of the discharge and stations outside of the discharge are found, but the impacted community remains characteristic of natural environmental conditions. While some disturbance is anticipated with increasing discharge, impacts would not be considered significant.

Elimination of discharge of untreated effluent at Punta Bandera by 2009 would be expected to reduce the severity of local impact at the discharge site. Impacts to benthic communities at Punta Bandera would not be considered significant.

The total volume of treated effluent that would be discharged from the SBOO is projected to double by 2023 as a result of this alternative. All effluent discharged from the SBOO under this alternative would be secondary treated. It is unknown what negative impacts a doubling in the volume of discharged effluent, albeit secondary treated, may pose to the ichthyofauna surrounding the SBOO. Wastewater receiving secondary treatment in Mexican would be discharged at Punta Bandera, with limited discharges of untreated effluent ceasing by 2009. The improved effluent quality at the Punta Bandera site would benefit the depressed fish assemblage at this location (City of San Diego, 2004a).

4.3.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP.

Terrestrial Biological Resources

Alternative 7 would not require construction of new facilities in the United States. Loss of terrestrial habitat would not occur. Impacts to terrestrial biological resources in the United States would not occur.

Estuarine Biological Resources

Alternative 7 would continue the diversion and treatment of Tijuana River dry weather flows. Control of dry weather flows would be considered a beneficial impact to estuarine biological resources.

Marine Biological Resources

No addition or reduction in impacts to the offshore benthic community would be anticipated as a result of this alternative. Monitoring of the benthic communities in the vicinity of the existing SBOO discharge has consistently shown no pattern of disturbance relative to pre-discharge conditions (City of San Diego, 2000-2004a). Based on this trend, immediate elimination of discharge through the SBOO would not be expected to result in changes to the local benthic community. Impacts to benthic communities from the reduction in discharge volume would not be considered significant.

Increasing the discharge of untreated effluent at Punta Bandera would be expected to increase the area of impact and may increase severity of local impact at the site of discharge. This alternative may result in the most severe local impact of any of the alternatives. While this may negatively impact local infaunal communities, the impact would not be considered a significant reduction of resources for higher trophic level, protected species.

Alternative 7 would result in closure of the SBIWTP, with all wastewater treated in Mexico. All effluent would be discharged at Punta Bandera, both treated and untreated. The peak levels of untreated discharge would severely impact the already depressed ichthyofauna (City of San Diego, 2004a), and allow for possible dispersal of untreated sewage into United States waters via ocean currents (Schwartzlose and Reid, 1972).

4.4 CULTURAL AND PALEONTOLOGICAL RESOURCES

This subchapter identifies the potential for impacts of the alternatives to cultural resources from short-term construction and long-term operation of the treatment alternatives identified for the SBIWTP. Impacts to paleontological resources in the United States are also evaluated in this subchapter.

Cultural resources have been identified within one mile of the project area. Among the 35 cultural resources identified within one mile of the SBIWTP, only four were within the boundaries of the facilities identified in the 1994 EIS. None of these four cultural resources were found eligible for NRHP listing. Additionally, two of the cultural resources have been destroyed during construction of the City of San Diego SBWRP. CA-SDI-11545, a non-eligible cultural resource, lies within the likely routes of pipelines proposed to connect the SBIWTP with facilities south of the United States/Mexico border. Impacts to this cultural resource will not constitute a significant impact.

There is a potential for construction activity to expose buried cultural resources. The discovery of previously undocumented cultural resources is addressed within the scope of the Programmatic Agreement executed March 11, 1994, between the USIBWC, USEPA Region IX, ACHP, SHPO, and the City of San Diego. The Programmatic Agreement was developed as a coordinated approach for the USIBWC and USEPA, as co-lead agencies, to satisfy their obligations to comply with Section 106 of the NHPA in managing cultural resources affected by the SBIWTP project and the City of San Diego.

The Programmatic Agreement between the signatories states that the USIBWC will ensure that the component stipulations of the agreement are carried out. A separate NHPA Section 106 consultation will be required for the selected alternative.

4.4.1 Standards of Significance

The National Register Criteria for Evaluation (36 CFR 60.4) provide the guidance in determining the eligibility of a cultural resource for listing on the NRHP. This guidance states that the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

1. is associated with events that have made a significant contribution to the broad patterns of our history;
2. is associated with the lives of persons significant in our past;
3. embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or
4. has yielded, or may be likely to yield, information important in prehistory or history.

Impacts to paleontological resources would be considered significant if unique paleontological resources or sites were to be directly or indirectly destroyed as a result of the action.

4.4.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. No construction would be required. Existing cultural and paleontological resources would not change from current conditions. The No Action Alternative Option A would have no impact on historic properties. For these reasons, impacts to cultural and paleontological resources would not occur.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. The cultural and paleontological resources at the SBIWTP would not change from current conditions, and construction-related impacts to existing cultural and paleontological resources in Mexico would not affect the surrounding community near the SBIWTP. The No Action Alternative Option B would have no impact on historic properties. For these reasons, impacts to cultural and paleontological resources would not occur.

4.4.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. The risk of disturbing fossils and paleontological resources during construction, while low, must also be considered during ground-disturbing activities. The cultural and paleontological resources environment at the SBIWTP would not change from current conditions. Construction-related cultural and paleontological resources in Mexico would not affect the surrounding community near the SBIWTP. Alternative 2 would have no impact on historic properties. For these reasons, impacts from cultural and paleontological resources would not occur.

4.4.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to Mexico. Construction-related cultural and paleontological resources in Mexico would not affect the surrounding community near the SBIWTP.

No impacts would occur to known historic properties through the construction of pipelines adjacent to Monument Road and between SBIWTP and SBWRP. There is a potential for impacts to buried and undiscovered cultural resources where excavation for these pipelines may extend into previously undisturbed strata. This potential for impacts was addressed as part of the Programmatic Agreement, which provides for the treatment of historic properties through the Section 106 process. Cultural resources discovered during excavation would be evaluated for NRHP eligibility following their discovery or considered eligible for listing by default and subjected to impact mitigation similar to mitigation contained in the Programmatic Agreement. Mitigation would be required for cultural resources discovered within the excavation path.

Due to the presence of the highly fossiliferous San Diego formation at the SBIWTP, Alternative 3 could result in disturbance to paleontological resources during the construction of the new pipelines to the SBWRP. Loss of scientific information that would be derived from paleontological resources would be considered a significant impact. In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options for providing implementing Public Law 106-457, as evaluated herein

4.4.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and a pump station would be constructed at the SBIWTP to transport effluent to Mexico. Construction-related cultural and paleontological resources in Mexico would not affect the surrounding community near the SBIWTP.

The creation of a new pump station at the SBIWTP proposed in Alternative 4 Option A would not impact historic properties. The construction of pipelines between a new treatment plant in Mexico or by the creation of a new pump station at the SBIWTP would be required for this alternative. The location of pipelines would be within the footprint of the SBIWTP. Approximately 500 feet of new pipeline would connect the SBIWTP with facilities in Mexico. The most likely route for this portion of the pipeline would not be expected to impact historic properties identified in the inventory. In the event that new historic properties are identified within the pipeline alignment or associated work areas, mitigation would be required.

Alternative 4 Option A (with either Discharge Option I or II) could result in disturbance in paleontological resources during the construction of the new pipelines and pump station at the SBIWTP. Loss of scientific information that would be derived from paleontological resources would be considered a significant impact. In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.5.2 Option B: Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico

Alternative 4 Option B (with either Discharge Option I or II) would result in no further operations at the SBIWTP with construction of new secondary treatment plant, pipelines and pump stations in Mexico. A new 59 mgd pipeline and pump station to convey treated effluent to Mexico would be constructed in Tijuana.

Although use of the SBIWTP would be discontinued, this alternative would require construction of new pipelines from the SBIWTP to convey treated effluent to Mexico. Impacts would be the same as Alternative 4 Option A. In order to prevent the potential for loss of cultural resources that could occur during construction, monitoring by a qualified archaeologist would be required. In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Construction of the Bajagua project pump station, portions of the force main and return flow pipeline in the United States would require grading, excavation and possibly compaction over a 6-month period.

The construction of pipelines between the SBIWTP and facilities in Mexico proposed in Alternative 4 Option C would not impact historic properties. The routes identified for these pipelines would not impact known historic properties. Other components of the alternative are either located in Mexico and would have no impact on historic properties, or are within the footprint of the SBIWTP and would have no impact on historic properties. Any cultural resources encountered during construction would be subject to evaluation and mitigation may be required.

The presence of the San Diego Formation presents a risk that paleontological resources would be found during construction. During construction, no significant fossils were encountered on the SBIWTP site. This formation is known to be highly fossiliferous and is present in the area of the pump station and pipeline (R.W. Beck, 2004).

Most of the pipeline route runs along the area of Tijuana River channelization and the presence of sensitive cultural or paleontological resources are unlikely to exist in this area. The pipeline route along the Alamar River and at the proposed Bajagua treatment plant site has the potential for cultural and paleontological resources. No resources have been identified in that area through March 2004 (R.W. Beck, 2004).

4.4.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.4.6.1 Option A: CMA Ponds at SBIWTP

The construction of new facilities at the SBIWTP proposed for Alternative 5 Option A would not impact historic properties. New facilities for this alternative would largely be within the boundaries of the former Hofer site, with connections to the SBIWTP. The former Hofer site was investigated for cultural resources as part of the 1998 DEIS and found not to include historic properties. Additionally, the level of disturbance at the property makes it unlikely that previously unidentified historic properties might be discovered during project implementation. Mitigation would be required for cultural resources discovered during project construction.

Alternative 5 Option A could result in disturbance in paleontological resources during the construction of the new pipelines and pump station at the SBIWTP. Loss of scientific information that would be derived from paleontological resources would be considered a significant impact. In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) would require construction of flow equalization facilities and secondary facilities at the SBIWTP. Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity) would result in construction of activated sludge facilities with additional secondary clarifiers at the SBIWTP. The construction of new facilities at the SBIWTP as proposed for Alternative 5 Option B (either option) would not impact historic properties. New facilities for this alternative would largely be within the boundaries of the former Hofer site, with connections to the SBIWTP. The former Hofer site was investigated for cultural resources as part of the 1998 DEIS and found not to include historic properties. Additionally, the level of disturbance at the property makes it unlikely that previously unidentified historic properties may be discovered during project implementation. Mitigation would be required for cultural resources discovered during project construction.

Construction on the 36-acre former Hofer site would result in ground disturbance that may expose paleontological material. In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. The construction of pipelines between a new treatment plant in Mexico and the SBIWTP proposed in Alternative 6 will not impact historic properties. The creation of new facilities at the SBIWTP would have no impact on historic properties. The likely routes for the proposed pipelines do not include historic properties. Should cultural resources be discovered during project implementation, mitigation would be required.

In order to prevent the potential for loss of paleontological resources that could occur during construction, monitoring by a qualified paleontologist would be required.

4.4.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP. No construction would be required. Existing cultural and paleontological resources would not change from current conditions. For these reasons, impacts to cultural and paleontological resources would not occur.

4.5 AIR QUALITY AND ODORS

4.5.1 Standards of Significance

Air quality impacts would be considered significant if they would noticeably change existing conditions in areas where sensitive receptors occur or are proposed (e.g., new residences) or if the daily emissions significance threshold values established by the San Diego Air Pollution Control District would be exceeded. These significance thresholds are as follows:

- Construction Activities — 55 lb/day for reactive organic compounds (ROC) and nitrogen oxides ($NO_{X)}$
  150 lb/day for PM_{10} and SO_X
  550 lb/day for carbon monoxide (CO)
- Operations — 75 lb/day for ROC
  100 lb/day for NO_X
  150 lb/day for PM_{10} and SO_X
  550 lb/day for CO

Air quality impacts of each alternative were evaluated by determining the amount of emissions that would be generated each day during the construction period. The air pollutant emissions were calculated based on the area of land to be disturbed using standard construction equipment over the expected construction period.

Air quality impacts would also be significant if the action does not conform to the EPA General Conformity requirements of the Clean Air Act. This requirement is discussed in Subchapter 6.1.6. Each of the alternatives would result in air pollutant emissions that are below conformity thresholds and would not be considered regionally significant. A conformity determination would not be required.

4.5.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. No construction would be required. The air quality at the SBIWTP and surrounding area would not change from current conditions. For these reasons, air quality impacts would not occur.

Alternative 1 Option A would result in continuation of the existing operation of the SBIWTP. Therefore, no changes in odor emissions would be expected to occur.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. The air quality at the SBIWTP would not change from current conditions. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of its distance. Air pollutant emissions that would be generated in Mexico were not calculated. For these reasons, impacts to air quality from construction in Mexico would not be considered significant.

Alternative 1 Option B would not be expected to result in changes in odor conditions.

4.5.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. The air quality at the SBIWTP would not change from current conditions, and construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. For these reasons, impacts to air quality from construction would not be considered significant.

Alternative 2 would not be expected to result in any changes in odor emissions.

4.5.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. The air pollutant emissions that would be generated from construction of Alternative 3 are shown on Table 4.5-1. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to Mexico.

Table 4.5-1. Estimated Construction Emissions from Alternative 3

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.01	0.00	0.02	0.00	1.46
pounds per day	0.109	0.034	0.323	0.034	13.53[a]
[a]Assumes site watering for dust control is conducted.					

Alternative 3 would result in temporary and localized increases in air pollution, in particular PM_{10}, during the construction of the new pipelines to the SBWRP. However, construction-related emissions are expected to be below significance threshold values. Upon operation of the plant after construction, the air quality at the SBIWTP would not change from current conditions. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. For these reasons, air quality impacts from construction would not be considered significant.

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipeline will be buried underground. Therefore, no changes in odor emissions would be expected to occur.

4.5.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three treatment options for providing implementing Public Law 106-457, as evaluated herein. There would be no impacts to air quality associated with any of the two discharge options for this alternative.

4.5.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and pump stations would be constructed in Mexico. Alternative 4 Option A would result in temporary and localized increases in air pollution, in particular PM_{10}, during construction of the new pipelines and pump station at the SBIWTP. The air pollutant emissions that would be generated from construction of Alternative 4 Option A are shown on Table 4.5-2. Construction-related emissions are expected to be below significance threshold values. Upon operation of the plant after construction, air quality at the SBIWTP would not change from current conditions. Air pollutant emissions from construction of pipelines from the SBIWTP to, and in, Mexico would be negligible. Construction-related air quality impacts at the Rio Alamar site in Mexico (approximately 3.5 miles southwest of the SBIWTP) would not affect the surrounding community near the SBIWTP because of distance. For these reasons, impacts to air quality from construction from Alternative 4 Option A would not be considered significant.

Table 4.5-2. Estimated Construction Emissions from Alternative 4 Option A

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.00	0.00	0.01	0.00	1.21
pounds per day	0.090	0.028	0.267	0.029	11.18[a]
[a]Assumes site watering for dust control is conducted.					

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of a new secondary treatment plant in the Alamar River Basin in Mexico. No changes in odor emissions would be expected to occur as a result of Alternative 4 Option A.

4.5.5.2 Option B: Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of a new secondary treatment plant, pipelines and pump stations in Mexico. A new 59 mgd pipeline and pump station to convey treated effluent to Mexico would be constructed in Tijuana. The air pollutant emissions that would be generated from construction of Alternative 4 Option B are shown on Table 4.5-3. Discontinuation of the use of the SBIWTP would result in an improvement in air quality from plant operations and traffic reduction. Because the employee traffic associated with plant operations is typically less than 40 vehicle trips per day, improvement in air quality at this location would not be substantial. For these reasons, the air quality at the SBIWTP would not be expected to differ from current conditions. Impacts to air quality in the United States would not occur. Air pollutant emissions from construction of pipelines from the SBIWTP to, and in, Mexico would be negligible. Construction-related air quality impacts from construction at the Rio Alamar site in Mexico (approximately 3.5 miles southwest of the SBIWTP) would not affect the surrounding community near the SBIWTP because of distance. Impacts to air quality from construction of Alternative 4 Option B would not be considered significant.

Table 4.5-3. Estimated Construction Emissions from Alternative 4 Option B

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.00	0.00	0.00	0.00	0.19
pounds per day	0.014	0.005	0.043	0.005	1.79[a]
[a]Assumes site watering for dust control is conducted.					

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of a new secondary treatment plant, pipelines and pump stations in Mexico. Construction would occur in Mexico and is not expected to affect the community surrounding the SBIWTP site. Therefore, no changes in odor emissions are expected to occur.

4.5.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Construction of the Bajagua LLC project pump station, portions of the force main and return flow pipeline in the United States would require grading, excavation and possibly compaction over a 6-month period. Alternative 4 Option C would result in temporary and localized increases in air pollution, in particular PM_{10}, during the construction of the pump station at the SBIWTP site. The air pollutant emissions that would be generated from construction of Alternative 4 Option C are shown on Table 4.5-4. Air pollutant emissions from construction of pipelines from the SBIWTP to, and in, Mexico would be negligible. Construction-related emissions in the United States would be below significance threshold values. Air quality impacts of construction activities at the Rio Alamar site in Mexico (approximately 3.5 miles southwest of the SBIWTP) would not be discernible in the United States because of distance. Upon operation of the SBIWTP following construction, air quality would be similar to existing conditions. For these reasons, air quality impacts of Alternative 4 Option C would not be considered significant.

Table 4.5-4. Estimated Construction Emissions from Alternative 4 Option C

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.01	0.00	0.02	0.00	1.54
pounds per day	0.115	0.036	0.340	0.036	14.22[a]
[a]Assumes site watering for dust control is conducted.					

Alternative 4 Option C would result in construction of the Bajagua LLC project pump station, and portions of the force main and return flow pipeline in the United States. The force main and return flow pipeline would be underground. The pump station is not expected to be a source of odors. Therefore, no changes in odor emissions are expected to occur.

4.5.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.5.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A would result in short-term air quality impacts associated with the construction of basins, tanks and associated equipment on the 36-acre former Hofer site adjacent to the SBIWTP. The primary source of air pollution from construction of the CMA ponds and associated structures would be from equipment and vehicles involved in site preparation, excavation, grading and compaction. Alternative 5 Option A would result in temporary and localized increases in air pollution, in particular PM_{10}, during the construction. The air pollutant emissions that would be generated from construction of Alternative 5 Option A are shown on Table 4.5-5. Construction-related emissions are expected to be below significance threshold values.

Table 4.5-5. Estimated Construction Emissions from Alternative 5 Option A

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.04	0.01	0.12	0.01	19.88
pounds per day	0.371	0.116	1.10	0.118	92.04[a]
[a]Assumes site watering for dust control is conducted.					

After the ponds are constructed, air quality at the SBIWTP would be similar to current conditions. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. Impacts to air quality would not be considered significant.

The 1999 SEIS included a hydrogen sulfide (H_2S) and odor study (Malcolm-Pirnie, 1997). In this study, modeling was used to predict levels of hydrogen sulfide and odors that would be generated from the SBIWTP. Predicted maximum hourly ground level concentrations of H_2S at or beyond the fenceline of the SBIWTP would be well below the SDAPCD permitted maximum hourly ground level H_2S concentrations. The model also predicted maximum hourly odor levels at ground level or beyond the plant fenceline to be well below the City of San Diego's suggested threshold values. Given the available data, the air dispersion modeling indicated that hydrogen sulfide and other odors would not be expected to impact the surrounding area as long as the plant is properly maintained and continues normal operating conditions.

4.5.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) would result in short-term air quality impacts associated with the construction of flow equalization facilities at the SBIWTP. The primary source of air pollution would be from equipment and vehicles on the site. The air pollutant emissions that would be generated from construction of Alternative 5 Option B-1 are shown on Table 4.5-6. Construction-related emissions are expected to be below significance threshold values.

Table 4.5-6. Estimated Construction Emissions from Alternative 5 Option B-1

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.04	0.01	0.12	0.01	39.75
pounds per day	0.186	0.058	0.550	0.059	92.02[a]
[a]Assumes site watering for dust control is conducted.					

After the flow equalization facilities are constructed, the air quality environment at the SBIWTP would be similar to current conditions. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. Impacts to air quality would not be considered significant.

Although the 1999 study to predict levels of H_2S and odors that would be generated from the SBIWTP did not specifically evaluate an activated sludge facility with a flow equalization basin, the model defined the odors that would be generated from an advanced primary treatment with activated sludge process. Predicted maximum hourly ground level concentrations of H_2S at or beyond the fenceline of the SBIWTP would be well below the SDAPCD permitted maximum hourly ground level H_2S concentrations. The model also predicted maximum hourly odor levels at ground level or beyond the plant fenceline to be well below the City of San Diego suggested threshold values. Given the available data, the air dispersion modeling indicated that H_2S and other odors would not impact the surrounding area as long as the plant is properly maintained and continues normal operating conditions.

Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity) would result in short-term air quality impacts associated with the construction of flow secondary clarifiers at the SBIWTP. The primary source of air pollution would be from equipment and vehicles on the site. The air pollutant emissions that would be generated from construction of Alternative 5 Option B-2 are shown on Table 4.5-7. Construction-related emissions are expected to be below significance threshold values.

Table 4.5-7. Estimated Construction Emissions from Alternative 5 Option B-2

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.04	0.01	0.13	0.01	44.17
pounds per day	0.206	0.065	0.611	0.065	102.25[a]
[a]Assumes site watering for dust control is conducted.					

After the secondary clarifiers are constructed, the air quality at the SBIWTP would be similar to current conditions. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. Impacts to air quality would not be considered significant.

Based on previous studies, H_2S and other odors would not be expected to impact the surrounding area as long as the plant is properly maintained and continues normal operating conditions.

4.5.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. Alternative 6 would result in temporary, localized air quality impacts during construction activities at the SBIWTP. The air pollutant emissions that would be generated from construction of Alternative 6 are shown on Table 4.5-8. Construction-related emissions are expected to be below significance threshold values. Construction-related air quality impacts in Mexico would not affect the surrounding community near the SBIWTP because of distance. For these reasons, the air quality impacts from Alternative 6 would not be considered significant.

Table 4.5-8. Estimated Construction Emissions from Alternative 6

	CO	VOC	NO_X	SO_X	PM_{10}
tons	0.05	0.02	0.15	0.02	37.74
pounds per day	0.313	0.096	0.927	0.099	116.47[a]
[a]Assumes site watering for dust control is conducted.					

Hydrogen sulfide and other odor concerns would be similar to those described for Alternative 5. Odors would not be expected to impact the surrounding area as long as the plant is properly maintained and continues normal operating conditions.

4.5.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP. An improvement in air quality associated with plant operations and traffic would result. Because the employee traffic associated with plant operations is typically less than 40 vehicle trips per day, the improvement in air quality at this location would not be substantial. For these reasons, the air quality at the SBIWTP would not be expected to differ from current conditions. Impacts to air quality would not occur.

Alternative 7 would result in closure and shutdown of the SBIWTP. As a result, odor emissions would be expected to decrease. Impacts from odors would not be expected.

4.6 NOISE

This subchapter identifies potential noise impacts of the alternatives, including short-term construction and long-term operation of the treatment options identified for the SBIWTP.

4.6.1 Standards of Significance

In considering the basis for evaluating significance of noise impacts, several items were examined, including: 1) the degree to which noise levels generated by demolition, construction and new operational activities were greater than the ambient noise levels; 2) the degree to which there would be annoyance and speech interference; and, 3) the proximity of noise-sensitive receptors such as housing and schools to the noise source. Noise impacts would be considered significant if the following noise standards established by the City of San Diego noise ordinance and the General Plan would be exceeded:

> *Construction near residential receptors should not exceed 75 dBA[2] L_{eq},[3] a 12-hour average for the hours of 7 am to 7 pm applied at the residential property line through the surrounding area. For operational noise, the City specifies a 1-hour average noise limit of 55 dBA L_{eq} during the hours of 7 am to 7 pm. The City of San Diego Noise Element of the General Plan establishes a traffic noise standard of 65 and 75 CNEL[4] for residential and industrial/agricultural areas, respectively.*

4.6.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. No construction would be required. The noise environment at the SBIWTP would not change from current conditions. For these reasons, impacts from noise would not occur.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. The noise environment at the SBIWTP would not change from current conditions, and construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, impacts from noise would not be considered significant.

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2 A-weighted decibels (corrected for human hearing)

3 Equivalent Sound Level

4 Community Noise Equivalent Level

4.6.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. The noise environment at the SBIWTP would not change from current conditions, and construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, impacts from noise would not be considered significant.

4.6.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to Mexico. Alternative 3 would result in temporary and localized increases in noise during the construction of the new pipelines to the SBWRP. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego. Upon operation of the plant after construction, the noise environment at the SBIWTP would not change from current conditions. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, impacts from noise would not be considered significant.

4.6.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options for providing implementing Public Law 106-457, as evaluated herein.

4.6.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and pump stations would be constructed in Mexico. Alternative 4 Option A would result in temporary and localized increases in noise during the construction of the new pipelines and pump station at the SBIWTP. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego. Upon operation of the plant after construction, the noise environment at the SBIWTP would not change from current conditions. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, impacts from noise from Alternative 4 Option A would not be considered significant.

4.6.5.2 Option B: Cease Operation of SBIWTP - Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of new secondary treatment plant, pipelines and pump stations in Mexico. A new 59 mgd pipeline and pump station to convey treated effluent to Mexico would be constructed in Tijuana. Discontinuation of the use of the SBIWTP would result in a decrease in noise from plant operations and traffic. Because the employee traffic associated with plant operations is typically less than 40 vehicle trips per day, the decrease in noise levels at this location would not be substantial. For these reasons, the noise environment at the SBIWTP would not be expected to differ from current conditions. For these reasons, impacts from noise would not occur. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, impacts from noise from Alternative 4 Option B would not be considered significant.

4.6.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Construction of the Bajagua project pump station, portions of the force main and return flow pipeline in the United States would require grading, excavation and possibly compaction over a 6-month period. Construction noise is projected to be in the range of 70 to 75 dBA L_{eq} at 100 ft (30 m) (R.W. Beck, 2004).

Construction of the pump station at the SBIWTP site would result in construction-related traffic that would occur on a temporary basis. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego. Construction traffic is not expected to result in noise impacts that would be considered significant. Noise impacts of construction activities in Mexico would not be discernible in the United States. Upon operation of the SBIWTP following construction, noise levels would be similar to existing conditions. For these reasons, noise impacts of Alternative 4 Option C would not be considered significant.

4.6.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.6.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A would result in short-term noise impacts associated with the construction of basins, tanks and associated equipment on the 36-acre former Hofer site adjacent to the SBIWTP. The primary source of noise from construction of the CMA ponds and associated structures would be from equipment and vehicles involved in site preparation, excavation, grading and compaction. Typical heavy equipment used at construction sites would generate noise levels from 69 to 83 decibels (db) at a distance of 100 feet (Construction Engineering Research

Laboratory [CERL], 1978). Construction activities would occur between 7:00 a.m. and 4:00 p.m., up to five days per week for the duration of the project. A temporary increase in construction-related vehicles along Dairy Mary Road was projected to result in an increase in noise levels from 56 to 62 CNEL (RECON, 1998b); however, no sensitive human receptors are located along this roadway. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego.

Alternative 5 Option A would require construction over an approximate 3-month period. After the ponds are constructed, the noise environment at the SBIWTP would be similar to current conditions. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. No changes in land use, traffic volumes or general traffic patterns, or other noise generating activities would occur. Impacts to the noise environment would not be considered significant. Therefore, mitigation would not be required for Alternative 5 Option A.

4.6.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) would result in short-term noise impacts associated with the construction of flow equalization facilities at the SBIWTP. The primary source of noise would be from equipment and vehicles on the site. Construction activities would occur between 7:00 a.m. and 4:00 p.m., up to five days per week for the duration of the project. A temporary increase in construction-related vehicles along Dairy Mary Road was projected to result in an increase in noise levels from 56 to 62 CNEL (RECON, 1998b); however no sensitive human receptors are located along this roadway. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego.

Alternative 5 Option B-1 would require construction over an approximate 3-month period. After the flow equalization facilities are constructed, the noise environment at the SBIWTP would be similar to current conditions. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. No changes in land use, traffic volumes or general traffic patterns, or other noise generating activities would occur. Impacts to the noise environment would not be considered significant. Therefore, mitigation would not be required for Alternative 5 Option B-1.

Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity) would result in short-term noise impacts associated with the construction of flow secondary clarifiers at the SBIWTP. The primary source of noise would be from equipment and vehicles on the site. Construction activities would occur between 7:00 a.m. and 4:00 p.m., up to five days per week for the duration of the project. A temporary increase in construction-related vehicles along Dairy Mary Road was projected to result in an increase in noise levels from 56 to 62 CNEL (RECON, 1998b); however, no sensitive human receptors are located along this roadway. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego.

Alternative 5 Option B-2 would require construction over an approximate 3-month period. After the secondary clarifiers are constructed, the noise environment at the SBIWTP would be similar to current conditions. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. No changes in land use, traffic volumes or general traffic patterns, or other noise generating activities would occur. Impacts to the noise environment would not be considered significant. Therefore, mitigation would not be required for Alternative 5 Option B-2.

4.6.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. Alternative 6 would result in temporary, localized noise impacts during construction activities at the SBIWTP. The projected noise levels would not exceed the 65 CNEL residential standard established by the City of San Diego. Construction-related noise in Mexico would not affect the surrounding community near the SBIWTP. For these reasons, the noise impacts from Alternative 6 would not be considered significant.

4.6.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP. A decrease in noise associated with plant operations and traffic would result. Because the employee traffic associated with plant operations is typically less than 40 vehicle trips per day, the decrease in noise levels at this location would not be substantial. For these reasons, the noise environment at the SBIWTP would not be expected to differ from current conditions. For these reasons, impacts from noise would not occur.

4.7 LAND USE

4.7.1 Standards of Significance

Although NEPA does not provide standards of significance for evaluating land use impacts, it does require that an EIS discuss possible conflicts between a proposed action and the objectives of federal, regional, state, and local land use plans, policies, and controls; identify any inconsistencies between the proposed action and any approved state or local plans or laws; and describe the extent to which the agency would reconcile its proposed plan with the plan or law. Based on that NEPA requirement, impacts to land use would be considered significant if the action would conflict with existing or planned land uses within or surrounding the project area, or if the action would conflict with:

- Existing plans and/or applicable goals, objectives, or policies of the City of San Diego;
- Community plans;
- Local coastal plan;
- Concept plan for Tijuana River Valley Regional Open Space Park; or,
- City of San Diego Multi-Species Conservation Plan.

Regulations and permits related to land use are further evaluated in Subchapter 6.1.4.

4.7.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

This Draft SEIS evaluates two options for the No Action Alternative. Option A assumes that Mexico would not improve its conveyance facilities to accommodate future flows to avoid dry weather flows to the Tijuana River. Option B assumes that Mexico would rehabilitate and expand its original open air conveyance channel (i.e., replace with a pipeline that increases capacity), such that during dry weather the original conveyance channel and the new parallel conveyance line could together handle all of the wastewater flows generated daily in the Tijuana region, less the 25 mgd that would be treated at the SBIWTP. As a result, dry weather flows to the Tijuana River would be avoided.

Alternative 1 Option A

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP as an advanced primary treatment plant treating an average of 25 mgd of flow. No construction would be required. Remaining flows would be retained in Mexico for treatment at SABWWTP or would bypass treatment at the SABWWTP and be released directly to the shoreline at Punta Bandera. The Punta Bandera discharge is mixed with ocean water in the surf zone by waves and currents, reducing pollutant concentration. Nevertheless, as described in Subchapter 4.1.2.1, prevailing longshore currents near the international border may carry pollutants northward into the United States.

Operation of the SBIWTP as an advanced primarily facility has eliminated dry weather discharges of untreated sewage to the Tijuana River. However by 2023, with the increased sewage generation in Tijuana, with improvement to Mexico's original conveyance channel, it is anticipated that there would be up to 9 mgd of dry weather sewage flows into the Tijuana River, as well as from winter storm runoff or equipment failures. This raw sewage would flow northward into the United States.

Continued operation of the existing SBIWTP would have no construction-related effect on existing or planned land uses in the project vicinity. However, discharges from Punta Bandera would cause concentrations at border Station S04 (located at the United States/Mexico Border) to exceed California Ocean Plan standards for total coliform bacteria in 2004, 2009 and 2023. Such exceedances could require beach closures and the loss of recreational use associated with unclean beaches. Imperial Beach coastal uses would be negatively impacted by the potential closures, which would conflict with the Tijuana River National Estuarine Management Plan, the Tijuana River Valley Plan and Local Coastal Program, and the City of San Diego Multiple Species Conservation Plan/Tijuana River Subarea Plan.

In addition, land uses along the Tijuana River, as well as Imperial Beach coastal uses would be negatively impacted by the discharge of raw sewage to the Tijuana River by 2023 which could also result in beach closures. These impacts to existing and planned land use would be considered significant.

Alternative 1 Option B

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would also result in continuation of the existing operation of the SBIWTP and no construction would be required. Mexico's rehabilitation/expansion of its original conveyance channel would eliminate the untreated sewage flows into the Tijuana River, while increasing the discharges of untreated effluent at Punta Bandera.

For a 40 mgd flow in 2009, potential exceedances of the total coliform objective would fall within allowable values of the California Ocean Plan. However, for 2023 conditions, compliance with the total coliform objective is not anticipated as Punta Bandera discharges would increase to 59 mgd and would be primarily untreated wastewater that bypasses the SABWWTP. As described for Alternative 1 Option A, the increased discharges at Punta Bandera could require beach closures and thereby have a significant impact on existing and planned land use in the project vicinity.

4.7.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico for discharge at Punta Bandera. Significant impacts to existing and planned land uses associated with increased discharge of untreated effluent at Punta Bandera would be similar to those identified for Alternative 1 Option B.

4.7.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP as an advanced primary facility at its current capacity of 25 mgd and would send up to 14 mgd to existing City of San Diego treatment facilities (SBWRP and PLWTP). The remaining 11 mgd of treated effluent would be returned to Mexico, where it would be mixed with untreated wastewater and discharged into the shoreline at Punta Bandera.

Construction in the United States would include a new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent back to Mexico.

Implementation of this alternative would not result in construction-related land use impacts. However, land use impacts associated with the increased discharge of untreated effluent at Punta Bandera would be similar to those identified for Alternative 1 Option B and would be significant.

4.7.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three treatment options for providing implementing Public Law 106-457 (Options A, B and C) and two options for discharging treated effluent (Discharge Options I and II), as evaluated herein.

4.7.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of a new secondary treatment plant in the Alamar River Basin in Mexico. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would include a new pump station at the SBIWTP site as well as approximately 800 feet of pipeline to transport the advanced primary treated effluent to Mexico and to return the secondary treated effluent from Mexico to the SBOO for discharge (in Discharge Option I). For Discharge Option II, a new pump station would be constructed at the secondary treatment plant in Mexico, to convey treated effluent to Punta Bandera for discharge.

Alternative 4 Option A would add new facilities at the SBIWTP but would not change the type existing uses at the site. No construction-related land use impacts would occur.

Discharge Option I

Under Discharge Option I, once operation of the Pubic Law 106-457 treatment plant commences, all wastewater generated in Tijuana would receive treatment prior to disposal. A portion of the treated effluent from the new facilities would be routed to the SBOO for discharge in accordance to requirements of the NPDES permit. It is estimated that flows routed to the SBOO would reach 40 mgd by the year 2009, and up to 59 mgd in 2023. At the same time, 25 mgd effluent currently treated at the SABWWTP would continue to be discharged at Punta Bandera.

In terms of the Punta Bandera coastal discharge, bacterial concentrations at border Station S04 could exceed the California Ocean Plan standard for total coliform bacteria. However, because these exceedances would have a low probability of occurrence that would fall within the allowable values specified by the California Ocean Plan, beach closures would not be anticipated. Therefore, Alternative 4 Option A with Discharge Option I would avoid the beach closures anticipated under Alternatives 1 Option B, 2, and 3 and the associated significant land use impacts.

Discharge Option II

With Discharge Option II, all flows from the new secondary treatment facilities in Mexico would be routed to Punta Bandera for disposal. The effluent would be discharged along with 25 mgd of treated effluent currently generated by the SABWWTP. Releases of untreated wastewater would be discontinued.

For the Punta Bandera coastal discharge, total coliform bacteria concentrations at the border are not likely to comply with California Ocean Plan objectives (Parsons 2004, Table 5-1). Non-compliance with the total coliform concentration objectives is anticipated for a discharge of 40 mgd of secondary effluent from new treatment facilities in 2009, and a 59 mgd discharge in 2023. These discharges would be discharged in conjunction with 25 mgd of treated effluent from the SABWWTP. Because the anticipated exceedance of the California Ocean Plan objective for total coliform bacteria could cause significant human health protection impacts, beach closures could be anticipated. Alternative 4 Option A with Discharge Option II would result in significant land use impacts, similar to those described for Alternative 1 Option B.

4.7.5.2 Option B: Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in the cessation of wastewater treatment operations at the SBIWTP. All wastewater flows would be retained in Mexico, with up to 59 mgd of wastewater flows being conveyed to the Public Law 106-457 facility for secondary treatment. Flows beyond 59 mgd and conveyed to the SABWWTP via the PCL for treatment. Under this option, a new secondary treatment plant in the Alamar River Basin in Mexico would be constructed. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would be limited to a new pipeline to transport the secondary treated effluent from the Public Law 106-457 treatment plant to the SBOO for discharge (under Discharge Option I).

Discharge Option II consists of retaining treated effluent in Mexico, and discharging it at Punta Bandera. This treatment option would require construction of a new pump station at the secondary treatment plant in Mexico to convey treated effluent to Punta Bandera for discharge.

All construction, with the exception of a portion of the return effluent pipeline (Discharge Option I) would occur in Mexico. This alternative would also eliminate the discharge of untreated effluent at Punta Bandera. Therefore, construction-related land use impacts in the United States would not result from Alternative 4 Option B under either discharge option.

Land use impacts associated with potential beach closures under Alternative 4 Option B would be similar to those described for Alternative 4 Option A, Discharge Options I and II, respectively.

4.7.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

The land use impacts for Alternative 4 Option C would be the same as those identified for Alternative 4 Option A under either discharge option.

4.7.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.7.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A was evaluated in the 1999 Final SEIS for Long-Term Treatment Options at the SBIWTP. This alternative would require the expansion of the SBIWTP to the former Hofer site for construction and operation of secondary treatment facilities on the former Hofer site.

This alternative is consistent with planned land uses in the area because the underlying local land use plans, including the community plan and local coastal program, both designate wastewater treatment facilities for the SBIWTP site and the former Hofer site. This alternative would also be consistent with existing uses on the SBIWTP site, as well as the vacant, former Hofer site.

The discharge of untreated effluent at Punta Bandera would be similar to that described for Alternative 1 Option B and could result in significant land use impacts.

4.7.6.2 Option B -1 and B-2 Activated Sludge Secondary Treatment

Alternative 5 Options B-1 and B-2 were evaluated in the 1999 Final SEIS for Long-Term Treatment Options at the SBIWTP. Land use impacts associated with these alternatives would be the same as those identified for Alternative 5 Option A.

4.7.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 Option B and 5 (Options A, B-1 or B-2) implementing secondary treatment in the United States and in Mexico. As such, it would require construction of new facilities as described for Alternatives 4 Option B and 5 (Options A, B-1 or B-2). Construction-related land use impacts would not result because this alternative would not conflict with existing or planned land uses associated with facility construction.

With the implementation of Alternative 6, untreated flows into the shoreline at Punta Bandera would be virtually eliminated once the Public Law 106-475 treatment facility commences operation in 2009. The Shore and Ocean Discharge Modeling Report (Table 4.1-1) indicates that bacterial concentrations at coastal station S04 from the Punta Bandera discharge could exceed the California Ocean Plan standard for total coliform bacteria. Those exceedances, however, would have a low probability of occurrence that would fall within the allowable value specified by the California Ocean Plan and are not anticipated to result in beach closures under either the 2009 or the 2023 discharge scenarios. This condition matches that previously described for Alternative 4 Option B, Discharge Options I and II. Discharge Option I would avoid the anticipated beach closures and significant land use impacts. However, Discharge Option II would result in significant land use impacts, similar to those described for Alternative 1 Option B.

4.7.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 assumes that the SBIWTP would be closed if compliance with the Clean Water Act cannot be achieved. This alternative also assumes that Mexico would make improvements to their wastewater collection and disposal system to handle projected sewage flows.

Alternative 7 would not result in changes in land uses in the United States. Mexico's improvements to their wastewater collection and disposal system would avoid dry weather discharges to the Tijuana River, which would avoid indirect impacts to land uses along the Tijuana River and the Imperial Beach coastal properties. For these reasons, impacts to land use would not be considered significant.

However, Alternative 7 would result in discontinuation of operations at the SBIWTP and increase the discharge of untreated wastewater to the shoreline at Punta Bandera from 31 mgd in 2004, to 40 mgd by 2009, and 59 mgd by 2023. Longshore currents would carry untreated sewage northward into the United States.

Bacterial concentrations at border Station S04 would exceed the California Ocean Plan standard for total coliform bacteria and could require beach closures. This condition would apply not only to the 2009 and 2023 discharge scenarios, but also to existing conditions because 25 mgd of wastewater currently treated at the SBIWTP would also be discharged without treatment at Punta Bandera. This alternative, then, has the most significant and immediate impacts to existing and planned land uses, relative to all other alternatives.

4.8 SOCIOECONOMICS

This subchapter evaluates aspects of the project that could result in significant impacts to socioeconomic resources in the project vicinity. These effects include the project's potential to affect population, income or induce economic growth.

NEPA provides no specific thresholds of significance for socioeconomic impact assessment. Significance varies depending on the setting of the proposed action (40 CFR 1508.27[a]).

4.8.1 Standards of Significance

The significance of growth-inducing impacts is typically assessed in terms of related effects on other socioeconomic factors, such as housing, public services, and local government expenditures. Therefore, project impacts would be considered significant if the employment created by the project would induce substantial growth or concentration of population and a need for substantial increases in infrastructure requirements. Project impacts would also be considered significant if revenue sources of local governments could not meet project-induced costs (e.g., increased costs associated with public health and safety).

4.8.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

4.8.2.1 Option A: No Future Improvements to Mexico's Conveyance System

Alternative 1 Option A assumes that existing operations of the SBIWTP as an advanced primary facility would continue, but that Mexico would not improve its conveyance facilities to accommodate future flows to avoid dry weather flows to the Tijuana River. Alternative 1 Option A would not require new construction. Therefore, this alternative would not generate additional business sales, income or employment from construction.

Operating and maintenance expenses for the SBIWTP would continue to provide a steady, long-term benefit by continuing to inject revenue in wages and expenditures into the regional economy every year. Treatment works operation and maintenance presently employs a permanent staff of 19 persons.

The low-intensity land use in the Tijuana River valley area and the fact that the majority of the existing SBIWTP facilities have been installed on undeveloped and public lands tends to minimize socioeconomic impacts from the continued operation of the SBIWTP. However, land uses along the Tijuana River and coastal use of Imperial Beach would be negatively impacted by the discharge of raw sewage to the Tijuana River by 2023, which could result in significant impacts to coastal-dependent businesses in the vicinity.

4.8.2.2 Option B: With Future Improvements to Mexico's Conveyance System

Alternative 1 Option B assumes that existing operations of the SBIWTP would continue. However, it assumes that Mexico would rehabilitate and expand its original open air conveyance channel (i.e., replace with a pipeline that increases capacity), such that dry weather flows to the Tijuana River would be avoided.

Direct and indirect short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of Alternative 1 Option B. Employment generated by construction activities would result in wages paid, an increase in business sales volume, and expenditures for local and regional services, materials and supplies.

The Economic Impact Forecast System (EIFS) Model, developed by the United States Army Construction Engineering and Research Laboratory, was used to assess the economic impacts of each treatment alternative. The EIFS model provides a systematic method for evaluating the regional socioeconomic effects of both private and government actions.

The estimated construction cost (capital costs) for project implementation and annual average income for construction laborers were the inputs used in the execution of the EIFS construction model. The economic Region of Influence (ROI) is considered to be San Diego County.

Using employment and income multipliers developed with a comprehensive regional/local database combined with economic export base techniques, the EIFS model estimates the economic impacts in terms of regional/local change in sales (business) volume, employment and personal income. Since the economic projections generated by the EIFS model are on an annual basis, the primary model input for construction costs was pro-rated over an estimated two (2) year construction period. The EIFS based employment and income multiplier for San Diego County is 3.71. This multiplier is applied to the initial direct employment and income created by project construction to calculate the employment and income indirectly created. This multiplier is also applied to the direct sales volume created to calculate indirect sales volume as a result of project construction.

Table 4.8-1 portrays the economic impacts of project construction under Alternative 1 Option B for business sales, income and employment in San Diego County. Direct, indirect and total impacts are indicated for each of these three economic variables. As indicated in Table 4.8-1, the economic impacts of construction would generate revenue and temporary employment. Direct employment reflects those workers who would accomplish demolition, renovation, and construction activities associated with the project, and additional direct employment created in the construction, retail and service sectors. Personal income represents the earnings of employees directly involved in the construction project in addition to those employees in the retail, wholesale and service establishments that are initially or directed affected by the construction activity. The increase in business volume reflects increases in the sales of goods, services and supplies associated with employment and income generated by project construction activity.

Table 4.8-1. Projected Annual Economic Impacts from Construction of Alternative 1 Option B, San Diego County

	Total	Direct	Indirect
Business Sales	$16,146,180	$4,352,070	$11,794,110
Income	$3,208,450	$864,811	$2,343,639
Employment (jobs)	86	23	63

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-1 also portrays the indirect annual regional impacts on secondary sales, employment and income generated by the employment and business activity directly associated with project construction. The direct increase in sales and employment generates secondary sales, and creates additional jobs indirectly in the retail trade, services and industry sectors, which results in additional indirect income. Indirect employment pertains to those jobs in the retail, wholesale, and service industries generated as a result of the proposed project. Income is indirectly impacted as a result of the indirect increase in sales and employment resulting from the initial economic impacts.

The EIFS model also includes a Rational Threshold Value (RTV) profile that is used in conjunction with the forecast models to assess the significance of impacts of an activity for a specific geographic area. For each variable (sales volume, employment, income and population), the current time-series data available from the USDOC Bureau of Economic Analysis (USDOC, 2000 and 2001) are calculated along with the annual change, deviation from the average annual change, and the percent deviation for each of these variables, which then defines a threshold for significant annual regional economic impacts for a variable. Within the EIFS model, the RTV is calculated for each of these variables when assessing the regional economic impacts of a specific project. If the RTV for a particular variable associated with the impacts of a specific project exceeds the maximum annual historic deviation for that variable, then the economic impacts are considered to be significant. If the RTV for a variable is less than the maximum annual historic deviation for that variable, then the regional economic impacts are not considered significant. With respect to the EIFS model assessment of the economic impacts of construction under Alternative 1 Option B, the RTVs for each of the three variables (sales volume, income, employment) were found to be significantly less than the regional RTVs for San Diego County. For this reason, project construction associated with Alternative 1 Option B would not result in significant annual local or regional economic impacts.

Under Alternative 1 Option B, operation of the SBIWTP in its present configuration is expected to continue to exert a positive economic effect on the local and regional economy by preventing dry weather sewage flows into the United States and reducing the potential for contamination.

4.8.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico for discharge at Punta Bandera. The economic impacts from construction of Alternative 2 on business sales, income and employment are shown on Table 4.8-2.

Table 4.8-2. Projected Annual Economic Impacts from Construction of Alternative 2, San Diego County

	Total	Direct	Indirect
Business Sales	$18,560,790	$5,002,908	$13,557,880
Income	$3,688,264	$994,141	$2,694,122
Employment (jobs)	86	23	63

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 2 were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

4.8.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP as an advanced primary facility at its current capacity of 25 mgd. The USIBWC would send up to 14 mgd to existing City of San Diego treatment facilities (SBWRP and PLWTP). The remaining 11 mgd of treated effluent would be returned to Mexico, where it would be mixed with untreated wastewater and discharged into the shoreline at Punta Bandera. New facilities in the United States would include a new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent back to Mexico. The economic impacts from construction of Alternative 3 on business sales, income and employment are shown on Table 4.8-3.

Table 4.8-3. Projected Annual Economic Impacts from Construction of Alternative 3, San Diego County

	Total	Direct	Indirect
Business Sales	$23,525,510	$6,341,108	$17,184,400
Income	$4,674,816	$1,260,058	$3,414,758
Employment (jobs)	108	29	79

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Alternative 3 would require a small number of locally-hired construction workers to construct the new facilities. Because the RTVs for business sales, income and employment for Alternative 3 were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts. The impacts associated with the additional temporary construction jobs would be minimal, but beneficial to the economy.

4.8.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

4.8.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of a new secondary treatment plant in the Alamar River Basin in Mexico. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico. Construction in the United States would include a new pump station at the SBIWTP site as well as approximately 800 feet of pipeline to transport the advanced primary treated effluent to Mexico and to return the secondary treated effluent from Mexico to the SBOO for discharge (in Discharge Option I). For Discharge Option II, a new pump station would be constructed at the secondary treatment plant in Mexico, to convey treated effluent to Punta Bandera for discharge. The economic impacts from construction of Alternative 4 Option A on business sales, income and employment are shown on Tables 4.8-4 and 4.8-5.

Table 4.8-4. Projected Annual Economic Impacts from Construction of Alternative 4 Option A, with Discharge Option I, San Diego County

	Total	Direct	Indirect
Business Sales	$68,698,599	$18,517,120	$50,181,380
Income	$13,651,260	$3,679,585	$9,971,675
Employment (jobs)	318	86	232

Source: CERL, 1984

Notes:

1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-5. Projected Annual Economic Impacts from Construction of Alternative 4 Option A, with Discharge Option II, San Diego County

	Total	Direct	Indirect
Business Sales	$85,917,840	$23,158,450	$62,759,400
Income	$17,072,960	$4,601,876	$12,471,090
Employment (jobs)	397	107	290

Source: CERL, 1984

Notes:

1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 4 Option A were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

Because this alternative would not substantially affect existing operations at the SBIWTP, no socioeconomic impacts in the United States would result, regardless of whether Discharge Option I or II is implemented. Over the long-term, fewer operational jobs would be created in the United States relative to Alternatives 5 and 6, because secondary treatment facilities would be located in Mexico (Bajagua LLC, 1999).

4.8.5.2 Option B: Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in the cessation of wastewater treatment operations at the SBIWTP. All wastewater flows would be retained in Mexico, with up to 59 mgd of wastewater flows being conveyed to a new Public Law 106-457 facility for secondary treatment. Flows beyond 59 mgd would be conveyed to the SABWWTP via the PCL for treatment. In addition to the treatment facility, new pipelines and pump stations would be constructed in Mexico.

Construction in the United States would be limited to a new pipeline to transport the secondary treated effluent from the Public Law 106-457 treatment plant to the SBOO for discharge (under Discharge Option I).

Discharge Option II required a new pump station to be constructed at the secondary treatment plant in Mexico, to convey treated effluent to Punta Bandera for discharge. The economic impacts from construction of Alternative 4 Option B on business sales, income and employment are shown on Tables 4.8-6 and 4.8-7.

Table 4.8-6. Projected Annual Economic Impacts from Construction of Alternative 4 Option B, with Discharge Option I, San Diego County

	Total	Direct	Indirect
Business Sales	$82,085,900	$22,125,580	$59,960,330
Income	$16,311,510	$4,396,632	$11,914,880
Employment (jobs)	379	102	277

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-7. Projected Annual Economic Impacts from Construction of Alternative 4 Option B, with Discharge Option II, San Diego County

	Total	Direct	Indirect
Business Sales	$100,118,200	$26,986,050	$73,132,190
Income	$19,894,760	$5,362,469	$14,532,290
Employment (jobs)	462	124	338

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 4 Option B were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

Alternative 4 Option B (either discharge option) would result in the loss of permanent staffing positions at the SBIWP, as well as the loss of wages and expenditures from current operations. While this impact would be adverse, it is not expected to have a significant impact on the regional economy.

4.8.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

The potential impacts of Alternative 4 Option C would result in beneficial socioeconomic impacts from construction activities. The economic impacts from construction of Alternative 4 Option B on business sales, income and employment are shown on Tables 4.8-8 and 4.8-9.

Table 4.8-8. Projected Annual Economic Impacts from Construction of Alternative 4 Option C, with Discharge Option I, San Diego County

	Total	Direct	Indirect
Business Sales	$64,275,780	$17,325,010	$46,950,770
Income	$12,772,410	$3,442,698	$9,329,712
Employment (jobs)	297	80	217

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-9. Projected Annual Economic Impacts from Construction of Alternative 4 Option C, with Discharge Option II, San Diego County

	Total	Direct	Indirect
Business Sales	$83,229,510	$22,433,830	$60,795,680
Income	$16,538,760	$4,457,886	$12,080,870
Employment (jobs)	384	104	280

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 4 Option C were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

A change in the location of the secondary treatment facility in Mexico would not substantially alter daily operations of the SBIWTP, nor would it result in substantial decreases in the number of employees needed to operate the facility in the United States. Socioeconomic impacts would not be anticipated.

4.8.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.8.6.1 Option A: CMA Ponds at SBIWTP

The economic impacts from construction of Alternative 5 Option A on business sales, income and employment are shown on Table 4.8-10. Alternative 5 Option A would result in beneficial impacts to socioeconomic factors in the local area.

Table 4.8-10. Projected Annual Economic Impacts from Construction of Alternative 5 Option A, San Diego County

	Total	Direct	Indirect
Business Sales	$36,815,350	$9,923,275	$26,892,080
Income	$7,315,676	$1,971,880	$5,343,796
Employment (jobs)	170	46	124

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 5 Option A were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

A change in secondary treatment technology would not substantially alter daily operations of the SBIWTP, nor would it result in a substantial increase in the number of employees needed to operate the facility. The former Hofer site is not located near any residential area in the United States or near pockets of housing. For this reason, impacts to population would not be expected as a result of this alternative.

4.8.6.2 Option B-1 and B-2 Activated Sludge Secondary Treatment

The economic impacts from construction of Alternative 5 (Options B-1 and B-2) on business sales, income and employment are shown on Tables 4.8-11 and 4.8-12. These alternatives would result in beneficial impacts to socioeconomic factors in the local area. Impacts to the local population would not be anticipated.

Table 4.8-11. Projected Annual Economic Impacts from Construction of Alternative 5 Option B-1, San Diego County

	Total	Direct	Indirect
Business Sales	$86,134,640	$23,216,880	$62,917,760
Income	$17,116,040	$4,613,488	$12,502,550
Employment (jobs)	398	107	291

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-12. Projected Annual Economic Impacts from Construction of Alternative 5 Option B-2, San Diego County

	Total	Direct	Indirect
Business Sales	$91,839,180	$24,754,500	$67,084,690
Income	$18,249,610	$4,919,032	$13,330,580
Employment (jobs)	424	114	310

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 5 Option A were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

4.8.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. Alternative 6 would require the construction described for in Alternatives 4 and 5.

The economic impacts from construction of Alternative 6 (with either CMA ponds or Activated Sludge as secondary treatment) on business sales, income and employment are shown on Tables 4.8-13 and 4.8-14, respectively. As identified for Alternatives 4 and 5, impacts to socioeconomic factors would be beneficial.

Table 4.8-13. Projected Annual Economic Impacts from Construction of Alternative 6 with CMA Ponds, San Diego County

	Total	Direct	Indirect
Business Sales	$21,723,360	$5,855,353	$5,868,010
Income	$4,316,706	$1,163,533	$3,153,173
Employment (jobs)	100	27	73

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Table 4.8-14. Projected Annual Economic Impacts from Construction of Alternative 6 with Activated Sludge, San Diego County

	Total	Direct	Indirect
Business Sales	$71,039,940	$19,148,230	$51,891,710
Income	$14,116,530	$3,804,996	$10,311,540
Employment (jobs)	328	88	240

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

Because the RTVs for business sales, income and employment for Alternative 5 Option A were found to be significantly less than the regional RTVs for San Diego County, project construction associated with this alternative would not result in significant annual local or regional economic impacts.

4.8.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 assumes that the SBIWTP would be closed if compliance with the Clean Water Act cannot be achieved. This alternative also assumes that Mexico would make improvements to their wastewater collection and disposal system to handle projected sewage flows. The economic impacts from construction of Alternative 7 on business sales, income and employment are shown on Table 4.8-15. Construction required in Mexico for this alternative would not result in significant annual local or regional economic impacts.

Table 4.8-15. Projected Annual Economic Impacts from Construction of Alternative 7, San Diego County

	Total	Direct	Indirect
Business Sales	$18,560,790	$5,002,908	$13,557,880
Income	$3,688,264	$994,141	$2,694,122
Employment (jobs)	86	23	63

Source: CERL, 1984

Notes:
1. Please refer to Appendix F for derivation, breakdown and assumptions associated with costs for this alternative.
2. Cost projections are based on preliminary estimates (refer to disclaimer in Appendix F)
3. Assumes that half of capital cost for facilities constructed in Mexico (e.g., material and equipment) would come from the United States.

4.9 PUBLIC HEALTH AND SAFETY

This subchapter identifies potential impacts of the alternatives on the public health and safety of the community that would result from short-term construction and long-term operation of the treatment options identified for the SBIWTP.

4.9.1 Standards of Significance

Health and safety impacts would be considered significant if resultant conditions at the facility resulted in an increased risk to health and safety of the surrounding community. An increase in public health and safety risk would occur if:

- If the community would be exposed to hazardous materials and hazardous wastes that could not be managed in accordance with applicable regulatory requirements;
- If the community were to be exposed to contamination on the property; or,
- If construction activities would interfere with ongoing remediation activities.

4.9.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. The SBIWTP would continue to be managed in accordance with applicable health and safety compliance requirements. Health and safety at the SBIWTP would not change from current conditions (there would be no change in operations). Alternative 1 Option A would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. This alternative would not result in exposure to any contamination on the site, and there are no remediation activities ongoing at the SBIWTP. For these reasons, impacts to public health and safety would not occur.

For the year 2023, up to 9 mgd of raw sewage would be discharged into the Tijuana River as a result of inability to accommodate projected flows. This condition would result in detrimental effects on the Tijuana River and potential health and safety hazards associated with contamination and vectors. This condition would result in a significant impact on public health and safety.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. The SBIWTP would continue to be managed in accordance with applicable health and safety compliance requirements. Health and safety at the SBIWTP would not change from current conditions. Alternative 1 Option B would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. This alternative would not result in exposure to any contamination on the site, and there are no remediation activities ongoing at the SBIWTP. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 1 Option B would result in an increase in discharge of untreated effluent from Punta Bandera. Under the 59 mgd discharge condition in 2023, bacterial concentrations in seawater may exceed California Ocean Plan standards in July and August resulting in temporary beach closures. This condition would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. The SBIWTP would continue to be managed in accordance with applicable health and safety compliance requirements. Alternative 2 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. This alternative would not result in exposure to any contamination on the site, and there are no remediation activities ongoing at the SBIWTP. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 2 would result in an increase in discharge of untreated effluent from Punta Bandera, from 65 mgd in 2009 to 84 mgd in 2023. Seawater bacterial concentrations in July and August (2009 to 2023) may exceed California Ocean Plan standards resulting in temporary beach closures. These conditions would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to

Mexico. Alternative 3 would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements. Construction at the SBIWTP and surrounding area would not be expected to result in exposure to contaminated sites because no further remediation is taking place at the SBIWTP. City of San Diego facilities would continue to be managed in accordance with applicable safety requirements. Alternative 3 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 3 would result in an increase in discharge of untreated effluent from Punta Bandera. Under the 70 mgd discharge condition in 2023, bacterial concentrations in seawater may exceed California Ocean Plan standards in July and August resulting in temporary beach closures. This condition would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options for providing implementing Public Law 106-457, as evaluated herein.

4.9.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and pump stations would be constructed in Mexico. Alternative 4 Option A would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements. Alternative 4 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. Construction activities associated with this alternative would not result in exposure to any contamination on the site or interfere with any remediation activities. The new secondary treatment facility in Mexico would be managed in accordance with applicable health and safety requirements. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 4 Option A with Discharge Option II would result in an increase in discharge of untreated effluent from Punta Bandera, from 65 mgd in 2009 to 84 mgd in 2023. Seawater bacterial concentrations in July and August (2009 to 2023) may exceed California Ocean Plan standards resulting in temporary beach closures. These conditions would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.5.2 Option B: Cease Operation of SBIWTP - Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of new secondary treatment plant, pipelines and pump stations in Mexico. A new 59 mgd pipeline and pump station to convey treated effluent to

Mexico would be constructed in Tijuana. This alternative would result in no further operation at the SBIWTP. Alternative 4 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. Construction activities associated with this alternative would not result in exposure to any contamination on the site or interfere with any remediation activities. The new secondary treatment facility in Mexico would be managed in accordance with applicable health and safety requirements. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 4 Option B with Discharge Option II of this alternative would result in an increase in discharge of untreated effluent from Punta Bandera, from 65 mgd in 2009 to 84 mgd in 2023. Seawater bacterial concentrations in July and August (2009 to 2023) may exceed California Ocean Plan standards resulting in temporary beach closures. These conditions would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Construction of the Bajagua project pump station, portions of the force main and return flow pipeline in the United States would require grading, excavation and possibly compaction over a 6-month period. Alternative 4 Option C would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements. Alternative 4 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. Construction activities associated with this alternative would not result in exposure to any contamination on the site or interfere with any remediation activities. The new secondary treatment facility in Mexico would be managed in accordance with applicable health and safety requirements. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 4 Option C with Discharge Option II would result in an increase in discharge of untreated effluent from Punta Bandera, from 65 mgd in 2009 to 84 mgd in 2023. Seawater bacterial concentrations in July and August (2009 to 2023) may exceed California Ocean Plan standards resulting in temporary beach closures. These conditions would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.9.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A would result in the construction of basins, tanks and associated equipment on the 36-acre former Hofer site adjacent to the SBIWTP. Alternative 5 Option A would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements being extended to CMA ponds and associated structures. Any changes in the amount of hazardous materials used and stored at, or transported to or from, the SBIWTP would be managed in accordance with applicable regulatory compliance requirements. Construction activities on the former Hofer site would not result in exposure to any contamination on the site or interfere with any remediation activities. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 5 Option A would result in an increase in discharge of untreated effluent from Punta Bandera. Under the 59 mgd discharge condition in 2023, bacterial concentrations in seawater may exceed California Ocean Plan standards in July and August resulting in temporary beach closures. This condition would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) would result in the construction of flow equalization facilities at the SBIWTP. Alternative 5 Option A would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements being extended to the activated sludge process and associated structures. Any changes in the amount of hazardous materials used and stored at, or transported to or from, the SBIWTP would be managed in accordance with applicable regulatory compliance requirements. Construction activities on the former Hofer site would not result in exposure to any contamination on the site or interfere with any remediation activities. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Alternative 5 Option B-2 (Activated Sludge with Expanded Capacity) would result in the construction of flow secondary clarifiers at the SBIWTP. Alternative 5 Option A would result in a continued management of the SBIWTP in accordance with applicable health and safety requirements being extended to the activated sludge process and associated structures. Any changes in the amount of hazardous materials used and stored at, or transported to or from, the SBIWTP would be managed in accordance with applicable regulatory compliance requirements. Construction activities on the former Hofer site would not result in exposure to any contamination on the site or interfere with any remediation activities. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

Either option of Alternative 5 would result in an increase in discharge of untreated effluent from Punta Bandera. Under the 59 mgd discharge condition in 2023, bacterial concentrations in seawater may exceed California Ocean Plan standards in July and August resulting in temporary beach closures. This condition would be considered a significant impact to health and safety, for which no mitigation is available.

4.9.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Options A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico. Alternative 6 would result in construction of secondary treatment facilities at the SBIWTP. This alternative would result in a continued management of the SBIWTP in accordance with applicable health and safety compliance requirements being extended to the selected secondary treatment process and associated structures. Alternative 6 would not result in any change in the amount of hazardous materials used, stored or transported to the SBIWTP, nor would any change in the amount of hazardous wastes generated occur. Construction activities associated with this alternative would not result in exposure to any contamination on the site or interfere with any remediation activities. For these reasons, impacts to public health and safety at the SBIWTP would not occur.

4.9.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. With discontinuation of operations at the SBIWTP, hazardous materials would no longer be used, stored or transported to the SBIWTP, nor would hazardous wastes be generated by the facility. This alternative would result in periods of time when the increased discharge of untreated effluent at Punta Bandera may result in high bacterial concentrations in seawater and possible beach closures in Imperial Beach. High bacterial concentrations in seawater used for recreation can pose a health hazard. Impacts to public health and safety at the SBIWTP would be considered significant.

Alternative 7 would result in an increase in discharge of untreated effluent from Punta Bandera, from 56 mgd in 2004 to 84 mgd in 2023. Under these conditions, seawater bacterial concentrations in July and August may exceed California Ocean Plan standards resulting in temporary beach closures. This condition would be considered a significant impact to health and safety, for which no mitigation is available.

4.10 ENVIRONMENTAL JUSTICE

Executive Order 12898 requires that each federal agency analyze the human health, economic, and social effects of federal actions, including the effects on minority communities and low-income communities.

The affected area is the footprint of land where potential adverse impacts could result from a planned activity. For this project, these are the United States census tracts that could be affected by wastewater discharge, noise, odors, air pollutant emissions or hazardous materials/wastes during construction activities or operations at the SBIWTP.

Environmental justice impacts can arise as a result of the use of hazardous materials and generation of hazardous waste. Based on the public health and safety analysis conducted for this SEIS, hazardous materials and wastes generated at the SBIWTP under any of the treatment or disposal alternatives would not be expected to differ from existing conditions. The use and disposal of hazardous and toxic materials would be managed in accordance with applicable regulatory requirements and, therefore, would not result in any increased in health hazards to the immediate community.

Impacts to geologic resources (e.g., soils), air quality, noise, and cultural resources would not be expected as a result of implementation of any of the alternative treatment or disposal options associated with Clean Water Act compliance at the

SBIWTP. For these reasons, the environmental justice analysis herein is limited to impacts to biological and water resources associated with changes in discharge of treated and untreated effluent for each alternative.

4.10.1 Standards of Significance

An impact to environmental justice would be considered significant if the federal action had disproportionately high and/or adverse human health or environmental effects on minority and low-income populations.

4.10.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 (Option A – No Improvement to Treatment or Conveyance Facilities in Mexico) in the year 2023 would result in discharge of up to 9 mgd of untreated effluent into the Tijuana River. The increase in bacterial load in the effluent would be considered to have an adverse effect on water quality and habitat of the Tijuana River, with potential exposure of a disproportionately high minority population in the area. The effluent flows through Census Tracts 100.09, 101.09 and 102. These census tracts are populated by disproportionately high minority populations with Census Tracts 100.09 and 102 exhibiting disproportionately high poverty rates. This would be considered an impact to environmental justice.

Alternative 1 Option B (with Improvement to Mexico's Treatment and Conveyance Facilities) would result in periods of time (e.g., July and August) in the year 2023 when bacterial concentrations in the ocean could exceed California Ocean Plan standards. These projections are based on shore and ocean discharge modeling associated with increases in discharge of effluent at Punta Bandera in Mexico and when the projected flow of wastewater is 59 mgd. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.10.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Under Alternative 2, the SBIWTP would continue to operate as an advanced primary facility. The treated flow would be conveyed to Mexico via the Parallel Conveyance Line. This alternative would not involve any construction or discharge of wastewater into the Tijuana River.

Alternative 2 (Treated Flows Returned to Mexico) would result in periods of time (e.g., July and August) in the years 2009 and 2023 when bacterial concentrations in the ocean could exceed California Ocean Plan standards. This condition would be associated with projected flows of 65 and 84 mgd and the resultant increase in discharge of untreated effluent at Punta Bandera. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.10.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned to Mexico

Under Alternative 3, the SBIWTP would continue to operate as an advanced primary facility at its current capacity of 25 mgd. However, direct discharges to SBOO would decrease. Two existing City of San Diego treatment facilities, the SBWRP and/or the PLWTP, would be used to complete the wastewater treatment process and discharge the treated effluent. This alternative would result in construction of new pipelines in the United States and an increase in the amount of untreated and treated wastewater that would be discharged at Punta Bandera.

Alternative 3 would result in periods of time (e.g., July and August) in the year 2023 and at 70 mgd flow when bacterial concentrations in the ocean could exceed California Ocean Plan standards. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.10.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Under Alternative 4, Public Law 106-457 allows secondary effluent from the facility to be reused in Mexico or the United States (after additional treatment) or discharged through the San Diego SBOO. Under Public Law 106-457, the facility would be a privately constructed and owned wastewater treatment facility in Mexico, financed under a 20-year contract. This alternative would require construction of pipelines and pump stations in the United States. This alternative would result in an increase in the amount of treated effluent that would be discharged at Punta Bandera, and an increase in wastewater flow discharge through the SBOO.

Alternative 4 Discharge Option II (Treated Effluent Discharged at Punta Bandera), for all treatment options, would result in periods of time (e.g., June and July) in the years 2009 and 2023 when bacterial concentrations in the ocean could exceed California Ocean Plan standards. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.10.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Under Alternative 5, secondary treatment facilities (CMA ponds or activated sludge) would be constructed at the SBIWTP to treat 25 mgd of wastewater with disposal to the SBOO. Temporary increase in noise, dust, and construction-related traffic may be experienced during the construction phase of the secondary treatment facilities. These effects would be prevented or reduced through proper noise and dust control during construction. This alternative would not result in any change to operational traffic near the plant because there would be no change in the number of employees, sludge hauling trucks, or chemical transport events. Generation of hydrogen sulfide and odors from the SBIWTP would not be expected under normal operating conditions and with proper maintenance.

Alternative 5 would result in an increase in discharge of untreated effluent at Punta Bandera, from 6 mgd in 2004 to 34 mgd by 2023. This alternative would result in periods of time (e.g., July and August) in the year 2023 and at flows of 59 mgd when bacterial concentrations in the ocean could exceed California Ocean Plan standards. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.10.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 consists of a combination of the treatment processes described in Alternatives 4 and 5, with the secondary treatment facilities being provided in the United States at the SBIWTP as well as in Mexico. Under Alternative 6, secondary treatment facilities would be provided at the SBIWTP (CMA ponds or activated sludge) to treat 25 mgd of wastewater with disposal to the SBOO. Flows beyond the capacity of the SBIWTP would be treated in Mexico at the SABWWTP (25 mgd) (conveyed via the PCL or OCC) with discharge to Punta Bandera and at a new Public Law 106-457 facility with disposal to the SBOO. Temporary increase in noise, dust, and traffic would be prevented or reduced through proper noise and dust control during construction. Traffic and odors would not be expected as a result of this alternative. Hydrogen sulfide and other odors that would result from Alternative 5 would not be expected to impact the surrounding area under normal operating conditions and with proper maintenance.

Although the amount of effluent discharged through the SBOO would increase, Alternative 6 would not be expected to result in bacterial concentrations that exceed California Ocean Plan standards for any of the years evaluated. For these reasons, disproportionately high and adverse human health and environmental effects on minority and low-income populations would not be expected.

4.10.8 Alternative 7: SBIWTP Closure/Shutdown

This alternative assumes that the SBIWTP would be closed if compliance with the Clean Water Act cannot be achieved and that Mexico would make improvements to its wastewater collection and disposal system to handle projected sewage flows. This alternative would not result in any construction in the United States. Alternative 7 would result in an increase in the discharge of untreated effluent at Punta Bandera, from 31 mgd in 2004 to 59 mgd in 2023.

Alternative 7 would result in periods of time (e.g., July and August) in the years 2004, 2009, and 2023 when bacterial concentrations in the ocean could exceed California Ocean Plan standards. Based on weather and ocean current conditions, it is possible that high bacterial concentrations could result in temporary beach closures particularly at Imperial Beach located in Census Tract 102. This would result in an adverse effect on a disproportionately high minority and low-income population.

4.11 ENERGY CONSUMPTION

4.11.1 Standards of Significance

An action would be considered to have a significant effect on the environment if it encourages activities that result in the use of large amounts of fuel, or if it uses fuel or energy in a wasteful manner. For the purposes of this document, energy impacts are considered significant if implementation of the selected alternative would result in any of the following:

- Substantial expansion of the existing electrical energy supply infrastructure (e.g., generation, transmission, and distribution lines) to service the project;
- Substantial increase over baseline conditions in peak load (kilowatts) and power production (kilowatt hours);
- Substantial increase over baseline conditions in fuel consumption required to construct the project facilities, or to transport, handle, and dispose of sludge;
- Use of energy in a wasteful or inefficient manner; or,
- Increase in annual energy consumption of at least one percent of the total current or projected baseline energy resource annual consumption within the San Diego region.

4.11.2 Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1 Option A (No Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP. No construction would be required. The operational energy consumption at the SBIWTP would not change from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area is anticipated. Therefore, impacts from energy consumption would not be expected.

Alternative 1 Option B (With Future Improvements to Mexico's conveyance system) would result in continuation of the existing operation of the SBIWTP and the rehabilitation/expansion of Mexico's conveyance channel. Construction would occur in Mexico. Only operational energy consumption in Mexico may change. The operational energy consumption at the SBIWTP would not change from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be expected as a result of this alternative. Therefore, impacts to energy consumption would not be expected.

4.11.3 Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

Alternative 2 would result in continuation of the existing operation of the SBIWTP and refurbishing of Mexico's original conveyance channel in order to transport treated effluent to Mexico. Construction of a new conveyance pipeline would occur in Mexico. An increase in operational energy consumption would occur in Mexico but not in the United States. The operational energy consumption at the SBIWTP would not change from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be expected as a result of this alternative. Therefore, impacts to energy consumption would not be expected.

4.11.4 Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 mgd of SBIWTP Effluent to City of San Diego Facilities with Remainder of SBIWTP Effluent Returned To Mexico

Alternative 3 would result in continuation of the existing operation of the SBIWTP with construction of new 30-inch diameter screened effluent and new 8-inch diameter sludge pipelines from the SBIWTP to the SBWRP. The pipelines would be approximately 3,200 feet in length. Construction in Mexico would consist of refurbishing the original conveyance channel in order to transport treated effluent to Mexico.

Construction-related energy consumption would primarily be related to equipment and vehicle fossil fuel use (essentially all diesel). Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established cost estimating methodologies for construction and experience with similar types of construction projects (Means, 1996). Heavy-duty construction equipment and vehicles consume from 5 to 20 gallons of diesel fuel per hour (EPA, 1991). Assuming maximum fuel consumption rate by all construction equipment (20 gallons per hour) during the entire duration of construction, approximately 453,600 gallons of diesel would be consumed. Under this “worst-case” scenario, the amount of diesel fuel consumed represents approximately 0.6 percent of the 1990 annual diesel energy consumption in the San Diego region. Construction energy consumption would not be expected to result in changes in infrastructure, peak loads or power production, fuel consumption or, wasteful or inefficient energy use, or an increase in annual energy consumption. Therefore, impacts to energy consumption would not be expected.

While new pipelines would be installed to connect the two facilities, no new operational electrical usage sources would be anticipated. An increase in operational energy consumption would occur in Mexico but not in the United States. The operational energy consumption at the SBIWTP would not change from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would result from implementation of the alternative. Therefore, impacts to energy consumption would not be expected.

4.11.5 Alternative 4: Public Law 106–457 (Secondary Treatment Facility in Mexico)

Alternative 4 identifies three options for providing implementing Public Law 106-457, as evaluated herein.

4.11.5.1 Option A: Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico

Alternative 4 Option A would result in continuation of the existing operation of the SBIWTP with construction of new secondary treatment plant in the Alamar River Basin in Mexico. New pipelines and pump stations would be constructed in Mexico. All construction would occur in Mexico.

As discussed in Subchapter 4.11.4, construction energy consumption would not be expected to have significant changes in infrastructure, peak loads or power production, fuel consumption; or wasteful or inefficient energy use, or an increase in annual energy consumption. Therefore, no impacts to energy consumption would be expected as a result of this alternative.

The operational energy consumption at the SBIWTP would not change from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area is anticipated. Therefore, impacts to energy consumption during operations would not be expected.

4.11.5.2 Option B: Cease Operation of SBIWTP - Conduct all Secondary Treatment in Mexico

Alternative 4 Option B would result in no further operations at the SBIWTP with construction of new secondary treatment plant, pipelines and pump stations in Mexico. Energy operational consumption at the SBIWTP would decrease from current conditions. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be anticipated. Therefore, impacts to energy consumption would not be expected.

4.11.5.3 Option C: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Alternative 4 Option C would require construction of the Bajagua LLC project pump station, portions of the force main and return flow pipeline in the United States. Construction-related energy consumption would not result in: changes to infrastructure, peak loads or power production, fuel consumption; wasteful or inefficient energy use; or, an increase in annual energy consumption. Therefore, impacts to energy consumption from construction would not be expected.

Operational energy consumption at the SBIWTP would increase from current conditions as a result of operation of the new pump station. This increase would not be considered significant in consideration of the available energy supply. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be anticipated. Therefore, impacts to energy consumption would not be expected as a result of this alternative.

4.11.6 Alternative 5: Secondary Treatment in the United States at SBIWTP

Alternative 5 identifies two options for providing secondary treatment in the United States at the SBIWTP, as evaluated herein.

4.11.6.1 Option A: CMA Ponds at SBIWTP

Alternative 5 Option A would result in the construction of basins, tanks and associated equipment on the 36-acre former Hofer site adjacent to the SBIWTP. Construction-related energy consumption would not result in significant changes in infrastructure, peak loads or power production, fuel consumption; or wasteful or inefficient energy use, or an increase in annual energy consumption. Therefore, impacts to energy consumption would not be expected.

Operational energy consumption at the SBIWTP would increase from current conditions as a result of CMA pond operations. This increase would not be considered significant in consideration of the available energy supply. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be anticipated. Therefore, impacts to energy consumption would not be expected as a result of this alternative.

4.11.6.2 Option B: Activated Sludge Secondary Treatment

Alternative 5 Option B-1 (Activated Sludge with Flow Equalization) and Option B-2 (Activated Sludge with Expanded Capacity) would result in construction at the SBIWTP. Construction-related energy consumption would not result in changes in infrastructure, peak loads or power production, fuel consumption; or wasteful or inefficient energy use, or an increase in annual energy consumption. Therefore, impacts to energy consumption would not be expected.

The operational energy consumption at the SBIWTP would increase from current conditions as a result of operation of the activated sludge process at the SBIWTP. This increase would not be considered significant in consideration of the available energy supply. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area would be anticipated. Therefore, impacts to energy consumption would not be expected as a result of this alternative.

4.11.7 Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 would result in a combination of Alternatives 4 and 5, implementing secondary treatment in the United States and in Mexico. This would result in continuation of operations at the SBIWTP utilizing either Option A, B-1 or B-2 of Alternative 5, while also implementing a new Public Law 106-457 treatment facility in Mexico (Alternative 4).

Construction-related activities would result in consumption of approximately 680,400 gallons of diesel. The amount of diesel consumed represents approximately 0.9 percent of the 1990 annual diesel energy consumption in the San Diego region. Construction energy consumption would not be expected to have significant changes in infrastructure, peak loads or power production, fuel consumption; or wasteful or inefficient energy use, or an increase in annual energy consumption. Therefore, impacts to energy consumption would not be expected.

The operational energy consumption at the SBIWTP would increase from current conditions as a result of operation of a new secondary treatment process at the SBIWTP. This increase would not be considered significant in consideration of the available energy supply. No changes in infrastructure, peak loads or power production, fuel consumption, wasteful or inefficient energy use, or an increase in annual energy consumption for the San Diego area is anticipated. Therefore, impacts to energy consumption would not be expected.

4.11.8 Alternative 7: SBIWTP Closure/Shutdown

Alternative 7 would result in closure and shutdown of the SBIWTP. This would result in discontinuation of operations at the SBIWTP. The operational energy consumption at the SBIWTP would cease since the facility would no longer be operational. This condition would result in a beneficial impact to energy resources in the United States.

4.12 CUMULATIVE IMPACTS

A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.12.1 Related and Proposed Projects

Other projects in the border region that could occur during the same time period as the Proposed Action were identified in Subchapter 2.4. The schedule for construction of planned projects has not been determined.

Water Resources

The continued discharge of untreated wastewater into the shoreline at Punta Bandera has a significant impact on the marine water quality in the United States. The SABWWTP in Mexico can currently treat 25 mgd. Any wastewater beyond 25 mgd bypasses treatment at the SABWWTP and is released directly at the shoreline at Punta Bandera, 5.6 miles south of the international border. These untreated sewage discharges affect the existing aquatic environment by introducing bacteria, viruses and carcinogenic constituents. Waves and currents mix the discharge with ocean water in the surf zone, which dilutes the discharged water and reduces the concentration of pollutants (EPA, 1997). Nevertheless, prevailing longshore currents near the international border carry pollutants northward into the United States. Monitoring results show that the San Antonio de los Buenos discharge site affects bacterial densities in Mexico and just north of the international border (City of San

Diego, 1996, 2000-2002, 2003d). The levels of trace elements (cadmium, zinc, and lead) in the marine water are also shown to be affected by the discharge (Wilhelmy and Flegal, 1991). Alternatives 4 and 6 would result in the elimination of the disharge of untreated effluent into the shoreline. All other alternatives would result in increased levels of untreated discharge into the shoreline. Because no other projects have been identified that could contribute to water quality impacts, cumulative impacts to water quality would not be expected.

Geological Resources

There are no other planned projects that have been identified which could result in significant impacts to geologic resources. With implementation of recommendations in the geotechnical site investigation and proper design of facilities to be seismic-resistant, cumulative impacts to geologic resources would not be expected.

Biological Resources

Biological impacts from construction of Alternative 5 would result in loss of terrestrial habitat (non-native grassland) at the SBIWTP (on the former Hofer site). Construction of Alternative 5 facilities and associated habitat loss would be considered significant. This alternative, when combined with other planned projects, may contribute to ongoing loss of terrestrial habitat in the area. When combined with other planned projects, all other alternatives would not contribute any long-term cumulative impacts to terrestrial, estuarine, or marine biological resources at the SBIWTP or the surrounding area.

Cultural Resources

Loss of cultural resources as a result of construction activities could contribute to a cumulative loss of this resource in the region. Impacts to cultural resources would not occur from Alternatives 1, 2 or 7 because construction would not be required. With mitigation as required for discovery of any previously undiscovered cultural material, impacts to cultural resources from Alternatives 3, 4, 5 or 6 would be avoided. For this reason, cumulative impacts to cultural resources would not be expected.

Paleontological Resources

Loss of paleontological resources would be considered a significant impact. When combined with other planned projects in the area, loss of paleontological resources that could result from implementation of Alternatives 3, 4, 5 or 6 could contribute to long-term cumulative impacts to paleontological resources.

Air Quality and Odors

Cumulative effects on air quality would not result from Alternatives 1, 2, or 7 because construction in the United States would not be required. Construction-related air pollutant emission for Alternative 3, 4, 5, and 6 would not be considered significant because emissions would be below SDAPCD threshold values. The selected alternative, when combined with other planned projects, would not contribute to long-term cumulative impacts to air quality.

Odors from operational activities at the SBIWTP would continue to be controlled for all treatment alternatives. Cumulative odor impacts would not be anticipated because no other planned projects that could contribute to odor problems have been identified.

Noise

Noise impacts from the Alternatives 3, 4 Option A and 5 would be limited to short-term increases in localized noise associated with construction activities at the SBIWTP. Following construction, the noise environment would be similar to baseline conditions. The selected alternative, when combined with other planned projects, would not contribute any long-term cumulative impacts to the noise environment at the SBIWTP and its surrounding area.

Land Use

None of the alternatives would result in significant impacts to land use. The selected alternative, when combined with other planned projects, would not contribute to any long-term cumulative impacts to land use in the area.

Socioeconomics

None of the alternatives would result in significant impacts to socioeconomics. The selected alternative, when combined with other planned projects, would not contribute to any long-term cumulative impacts to socioeconomics in the San Diego area.

Public Health and Safety

Public health and safety impacts from the treatment and disposal alternatives evaluated would not be expected under normal operating conditions and with proper maintenance. The SBIWTP would continue to manage hazardous materials and waste in accordance with applicable regulatory requirements. The selected alternative, when combined with other planned projects, would not be expected to contribute to any long-term cumulative impacts to public health and safety.

Environmental Justice

With the exception of Alternatives 1 (Treatment Option A), 4 (Discharge Option I), and 6, adverse effects on a disproportionately high minority and low-income population would be expected. There are no other planned projects in the area of the SBIWTP that would contribute to cumulative adverse effects on environmental justice. Therefore, cumulative impacts on environmental justice would not be expected.

Energy Consumption

None of the alternatives would result in significant impacts to energy supplies. The selected alternative, when combined with other planned projects, would not contribute to any long-term cumulative impacts to energy supplies in the San Diego area.

4.13 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are environmental consequences of an action that cannot be avoided either by changing the nature of the action or through mitigation if the action is undertaken. Unavoidable environmental effects would result from implementation of alternative treatment or discharge options; however, none of the effects would be considered significant. The following unavoidable adverse impacts have been identified for the alternative treatment options:

Hydrology and Water Quality

Unavoidable adverse impacts on hydrology and water quality have been identified for alternatives where the SBIWTP and proposed Public Law 106-457 facilities include construction.

Alternative 1 Option B (With Future Improvements to Mexico's Existing Conveyance Systems) would result in construction and sewage discharge combined with seasonal flooding of the Tijuana River watershed. This condition would be an unavoidable adverse impact on hydrology and water quality of the Tijuana River.

Alternative 3 would result in surface and subsurface changes made during construction combined with seasonal flooding of the Tijuana River watershed and discharge of blended advanced primary effluent and untreated wastewater into the shoreline at Punta Bandera. This condition would be an unavoidable adverse impact on hydrology and water quality.

Alternative 4 Option A and B would result in alteration of topography, changes in drainage patterns, loss of percolation from increases in impervious areas, and elimination of the discharge of untreated flows into the shoreline. Unavoidable adverse impacts to hydrology and water quality would not be expected.

Alternative 4 Option C would result in elimination of the discharge of untreated flows into the shoreline. Unavoidable adverse impacts on hydrology and water quality would not be expected.

Alternative 5 Option A would result in untreated sewage being carried northward into the United States. This condition would result in an unavoidable adverse impact on hydrology and water quality.

Alternative 5 Option B would result in untreated sewage being carried northward into the United States. This condition would be an unavoidable adverse impact on hydrology and water quality.

Geological Resources

Unavoidable adverse impacts on geological resources have been identified for the SBIWTP and the Public Law 106-457 site where treatment alternatives include construction.

Alternative 1 Option B (With Future Improvements to Mexico's Existing Conveyance Systems) would result in elimination of untreated sewage flows into the Tijuana River. Limitations of the SABWWTP would cause this additional wastewater to bypass the SABWWTP, increasing the amount of untreated sewage released at Punta Bandera. The proposed construction and resulting sewage discharge combined with seasonal flooding of the Tijuana River watershed would result in an unavoidable adverse impact on geological resources.

Alternative 3 would result in erosion and sedimentation in natural drainage areas. Surface and subsurface alteration from construction combined with seasonal flooding of the Tijuana River watershed would be an unavoidable adverse impact on geological resources.

Alternatives 4 (Options A, B and C) and 5 (Options A and B) would result in erosion and sedimentation in natural drainage areas. This would be an unavoidable adverse impact on geological resources.

Biological Resources

The loss of non-native grassland habitat at the SBIWTP on the former Hofer site as a result of Alternative 5 would be an unavoidable adverse impact to biological resources.

Cultural Resources

With mitigation of impacts to cultural resources, there would be no unavoidable impacts to cultural resources.

Paleontological Resources

Adverse impacts on the paleontological resources of the SBIWTP project area are considered low, due to the predominance at the surface of the young deposits of Quaternary alluvium. Where older rocks from previous formations are exposed onsite, no fossils have been reported. The possibility of adversely impacting the paleontological resources in the project area must be considered during the construction activities required for Alternatives 3, 4 (Options A and B), and 5 (Options A and B).

Alternative 3 would result in the construction of a new 30-inch diameter screened effluent, and approximately 3,200 feet of 8-in sludge pipelines from SBIWTP to SBWRP. The construction area is previously disturbed, so additional adverse impacts are unlikely.

While the likelihood of uncovering paleontological resources is low, the possibility of disturbance of fossils exists. Any loss of paleontological resources and associated scientific information would be considered a significant impact.

Construction for Alternative 5 would take place on 36 acres of previously disturbed land. The likelihood of adversely affecting paleontological resources is low; however, the possibility of new construction disturbing fossils does exist.

With implementation of mitigation measures to avoid or minimize loss of paleontological resources, there would be no impacts that would be unavoidable.

Air Quality and Odors

The generation of air pollutants during construction activities would be an unavoidable adverse impact. This condition would be temporary. The emanation of odors from the SBIWTP would not be expected. However, there may be instances when the Tijuana River will generate odors as a result of weather conditions. This would be considered an unavoidable adverse impact (although not related to the SBIWTP).

Noise

The construction activities associated with Alternatives 3, 4 Option A and 5 would result in temporary increases in noise, which is an unavoidable adverse impact. Upon completion of construction activities, the noise environment would return to its previous condition. The temporary and localized increase in noise would not exceed the threshold of significance for noise impacts, and, therefore, would not be considered significant.

Land Use

No change to land use would be expected, with the exception of Alternative 5 which would result in conversion of open space to treatment facilities. The conversion of up to 36 acres of vacant land on the SBIWTP site would be an unavoidable impact to land use.

Socioeconomics

The negative economic effect on coastal-dependent businesses along the Tijuana River and at Imperial Beach would be considered an unavoidable, adverse effect on socioeconomics.

Public Health and Safety

The potential health hazard from contamination at the Tijuana River and recreational use of contaminated seawater would be considered an unavoidable, adverse impact to public safety and health.

Environmental Justice

The continued adverse impacts to minority and low-income populations in the vicinity of the Tijuana River and Imperial Beach would be considered an unavoidable, adverse impact to environmental justice.

Energy Consumption

The use of non-renewable energy sources during construction and continue operation of the SBIWTP would be an unavoidable impact.

4.14 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

This analysis investigates the relationship between short-term uses of the environment and the maintenance and possible enhancement of long-term productivity. Improving wastewater treatment and compliance with Clean Water Act requirements would provide value in improved water quality conditions in the border region. There would be no disruptions of short-term uses of coastal resources and Tijuana River estuary or known effects on long-term productivity of these areas.

4.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the use of these resources would have on consumption or destruction of a resource that could not be replaced in a reasonable period of time. The irreversible environmental changes that could result from implementation of the alternative actions include consumption of material resources, energy resources, and human resources.

Material resources used for the alternative actions include building materials for construction of wastewater treatment and disposal facilities. The materials that would be consumed are not in short supply and are readily available from suppliers in the region. Use of these materials would not limit other unrelated construction activities and, therefore, would not be considered significant.

Energy resources would be irretrievably lost. These include petroleum-based products such as gasoline and diesel fuel. During construction or dredging activities, gasoline and diesel fuel would be used for operation of equipment and other vehicles. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no adverse impacts would be expected.

The use of human resources for construction activities is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the alternative actions represents employment opportunities and is considered beneficial.

CHAPTER 5 – ENVIRONMENTAL COMMITMENTS

This chapter identifies specific potential mitigation in accordance with CEQ regulations in 40 CFR Sections 1502.14(f), 1502.16(h) and 1508.14. Mitigation measures discussed in an EIS must cover the range of impacts of the proposal. Such measures may include design alternatives that would decrease pollution emissions, construction impacts, esthetic intrusion, as well as relocation assistance, possible land use controls that could be enacted, and other possible efforts.

Mitigation requirements are described for each alternative. This chapter also describes mitigation monitoring for each alternative.

5.1 MITIGATION SUMMARY

Mitigation measures have been identified for significant impacts when such mitigation is within the jurisdiction of the lead or cooperating agencies, and is likely to be adopted or enforced by the responsible agency. All relevant, reasonable mitigation measures that could improve the project have been identified for environmental resource areas.

Table 5.1-1 is a summary of significant environmental impacts for each alternative as evaluated in Chapter 4. This table identifies those impacts for which mitigation measures are required. While the determination of significance for these particular impacts triggers a requirement for mitigation, there are impacts for which no mitigation is available to the USIBWC. Table 5.1-1 distinguishes those impacts which can be mitigated and those for which no mitigation is available. When mitigation of significant impacts is not available, significant impacts may be avoided by selecting another alternative.

Mitigation measures for impacts to biological, cultural and paleontological resources would be accomplished by the USIBWC. The specific mitigation measures for these three resource areas are described in Table 5.1-2.

As shown on Table 5.1-1, no mitigation is required for impacts to geological resources, air quality and odors, noise, land use, socioeconomics or energy consumption. Although no mitigation measures are required, best management practices for geologic resources and air quality have been identified in order to avoid or minimize adverse effects on these resources. Best management practices are identified on Table 5.1-3.

Table 5.1-1. Mitigation Summary for Alternative Treatment and Discharge Options

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Water Resources(Subchapter 4.1)															
Water quality from Punta Bandera coastal discharge in comparison to California Ocean Plan standards for protection of human health.		●	●	●		●		●		●	●	●	●		●
Water quality from Punta Bandera discharge in comparison to California Ocean Plan standards for protection of marine aquatic life.	●	●	●	●		●		●		●	●	●	●		●
Water quality from direct discharge of wastewater into the Tijuana River exceeds objectives for protection of aquatic life in the Tijuana River.	●														
Biological Resources (Subchapter 4.3)															
Terrestrial Resources. Loss of up to 30 acres of non-native grassland (sensitive habitat)											◈	◈	◈	◈	
Impact to non-native grassland from construction of pipelines connecting SBIWTP and the Bajagua Project treatment plant site									◈	◈					
Disturbance of least Bell's vireo from construction traffic noise along transportation routes to the SBIWTP site									◈	◈					
Impacts to Southwestern willow flycatcher and least Bell's vireo from construction of eastern pipeline corridor in Mexico									◈	◈					
Loss of up to 33-acres of annual grassland at Bajagua Project treatment plant site									◈	◈					

● No Mitigation is Available to the USIBWC

◈ Mitigation to be Accomplished by the USIBWC

Table 5.1-1. Mitigation Summary for Alternative Treatment and Discharge Options (Cont'd)

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Estuarine Resources. Degradation of infaunal species and estuarine habitat at the Tijuana River	●														
Marine Resources. Degradation of benthic communities from increased discharge at Punta Bandera resulting in reduction of higher trophic level resources for protected species	●	●	●	●		●		●		●	●	●	●		●
Cultural and Paleontological Resources (Subchapter 4.4)															
Cultural Resources. Potential loss of archaeological material as a result of construction				◈	◈	◈			◈	◈	◈	◈	◈	◈	
Paleontological Resources. Potential loss of paleontological material as a result of construction				◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	
Land Use (Subchapter 4.7)															
Adverse effect on land uses along the Tijuana River and at Imperial Beach as a result of discharge of raw sewage into the Tijuana River.	●														
Socioeconomics (Subchapter 4.8)															
Economic effect on coastal-dependent businesses at Imperial Beach and along the Tijuana River	●														
Public Health and Safety (Subchapter 4.9)															
Potential health hazard from contamination and vectors associated with discharge into the Tijuana River	●														
Potential health hazard from recreational use of seawater contaminated by increased discharge at Punta Bandera or SBOO		●	●	●		●		●		●	●	●	●		●

● No Mitigation is Available to the USIBWC

◈ Mitigation to be Accomplished by the USIBWC

Table 5.1-1. Mitigation Summary for Alternative Treatment and Discharge Options (Cont'd)

	Alternative														
	1		2	3	4						5			6	7
	A	B			A-I	A-II	B-I	B-II	C-I	C-II	A	B-1	B-2		
Environmental Justice (Subchapter 4.10)															
Adverse effect on minority and low-income population from discharge of untreated sewage into the Tijuana River (2023)	●														
Adverse effect on minority and low-income population from temporary beach closures due to high bacterial concentrations in seawater (July/August 2009 – 2023)		●	●	●		●		●		●	●	●	●		●

● No Mitigation is Available to the USIBWC

◈ Mitigation to be Accomplished by the USIBWC

Table 5.1-2. Mitigation Measures for Clean Water Act Compliance at the SBIWTP

Mitigation Measure	Required for Alternative(s)	Responsible Agency
Terrestrial Biological Resources		
Mitigation would be required for the loss of up to 30 acres of non-native grassland, a sensitive biological resource in the City of San Diego. Mitigation would be required typically at a 0.5 to 1 mitigation ratio. Mitigation may be accomplished with preservation or restoration/creation of similar or better quality habitat. The mitigation completed for impacts to non-native grassland would offset the temporary loss of foraging habitat for raptors. With incorporation of this mitigation measure, impacts to terrestrial biological resources would be mitigated to a less than significant level.	Alternatives 5 (Options A, B-1 and B-2) and 6	USIBWC
Mitigation would be required for the potential loss of non-native grassland associated with the construction of pipelines connecting the SBIWTP and the Bajagua project site. Mitigation would be required typically at a 0.5 to 1 mitigation ratio. Mitigation may be accomplished with preservation or restoration/creation of similar or better quality habitat. The mitigation completed for impacts to non-native grassland would offset the temporary loss of foraging habitat for raptors. With incorporation of this mitigation measure, impacts to non-native grasslands would be mitigated to a less than significant level.	Alternative 4 (Options A and C)	USIBWC
Standard techniques for reducing construction noise impacts such as using noise suppressing mufflers on construction equipment and complying with the local noise control ordinance would reduce potential noise impacts on least Bell's vireo in the vicinity of the SBIWTP to a less than significant level.	Alternative 4 (Options A and C)	USIBWC
Confirmatory surveys and directed searches for least Bell's vireo, and southwestern willow flycatcher in the vicinity of the pipeline alignment along the Alamar River shall be conducted. Vireo and flycatcher surveys/directed searches shall be initiated between mid-March and mid-May prior to the initiation of construction. If the least Bell's vireo, or the southwestern willow flycatcher are confirmed to be present in riparian habitats along the pipeline corridor, the corridor shall be adjusted to avoid these habitats and provide the appropriate buffers. Depending on the proximity of construction activity, adjusting the construction schedule to avoid noise and glare impacts during critical life stages may also be required. In addition, surveys of raptor nests and roosts shall be conducted in the vicinity of the pipeline alignment along the Alamar River prior to the initiation of construction. If raptor nests or roosts are confirmed to be present, the pipeline location will be adjusted to avoid these habitats and provide appropriate buffers. Depending on the proximity of construction activity, adjusting the construction schedule to avoid noise and glare impacts during critical life stages may also be required.	Alternative 4 (Option C)	USIBWC

Table 5.1-2. Mitigation Measures for Clean Water Act Compliance at the SBIWTP (Cont'd)

Mitigation Measure	Required for Alternative(s)	Responsible Agency
Mitigation would be required for the loss of 33.0 acres of annual grassland at the Bajagua Project treatment plant site. Mitigation would be required, typically at a 0.5 to 1 mitigation ratio. Mitigation may be accomplished by preserving 17.0 acres on-site. Adequate land is available for mitigation including 11.0 acres of annual grassland and 48.4 acres of disturbed habitat, portions of which would be rehabilitated for mitigation. Removal of the cattle ranch upon initiation of construction, will allow the area to naturally revegetate into annual grassland. Temporary construction staking or fencing will be erected under the supervision of a qualified biologist at, or near the edge of the preserved habitat, prior to any brushing or grading activities to limit disturbance of the habitat. The mitigation completed for impacts to annual grassland would offset the temporary loss of foraging habitat for raptors. With incorporation of this mitigation measure, impacts to annual grasslands would be mitigated to a less than significant level.	Alternative 4 (Option C)	USIBWC
Cultural Resources		
In the event cultural materials are encountered during construction, the contractor shall immediately suspend work in the area of the find until the material can be evaluated by a qualified cultural resource specialist. Cultural resources discovered during excavation would be evaluated for NRHP eligibility following their discovery or considered eligible for listing by default and subjected to impact mitigation as called for in the Programmatic Agreement. Impacts to historic properties discovered within the excavation path would be mitigated to a level below significance through implementation of the terms of the Programmatic Agreement. With incorporation of this mitigation measure into project planning, impacts to cultural resources would be considered mitigated to a less than significant level.	Alternatives 3, 4 (Options A and C, Discharge Options I and II), 5 (Options A, B-1 and B-2) and 6	USIBWC
Paleontological Resources		
Due to the potential for disturbance to paleontological resources in the highly fossiliferous San Diego formation at the SBIWTP and in the surrounding area, paleontological monitoring of construction of pipelines and the pump station would be required. A Paleontological Resource Mitigation Plan will be prepared by a qualified paleontologist and implemented by the USIBWC. The plan will identify: • Specific areas to be monitored during excavation and other ground-disturbing activities; • Procedures for recovery and preservation of paleontological material found on the site (including transfer of fossils to repositories); • Reporting of these findings. With incorporation of this mitigation measure into project planning, impacts to paleontological resources would be considered mitigated to a less than significant level.	Alternatives 3, 4 (all options), 5 (all options) and 6	USIBWC

Table 5.1-3. Best Management Practices for Clean Water Act Compliance at the SBIWTP

Best Management Practice	Required for Alternative(s)	Responsible Agency
Geological Resources		
Facilities would be sited, designed and constructed in accordance with applicable engineering standards for seismic resistance. .	Alternatives 3, 4 (all options), 5 (all options) and 6	USIBWC
Recommendations of the geotechnical site investigation would be incorporated into project design and planning.	Alternatives 3, 4 (all options), 5 (all options) and 6	USIBWC
Air Quality		
Site watering would be conducted during ground-disturbing construction activities to reduce generation of fugitive dust.	Alternatives 3, 4 (all options), 5 (all options) and 6	USIBWC

5.2 MITIGATION MONITORING

The following mitigation monitoring and reporting requirements have been identified for the treatment alternatives evaluated herein:

- The USIBWC would ensure that preservation or restoration of non-native grassland, a sensitive biological resource in the City of San Diego, is monitored to ensure that this mitigation is accomplished in a timely manner for the selected alternative. A monitoring report for this mitigation will be kept on file at the USIBWC office in San Diego, California.
- The USIBWC would ensure that any mitigation of cultural material found during construction and excavation activities, is monitored to ensure that this mitigation is accomplished in a timely manner and in accordance with the Programmatic Agreement for the SBIWTP. A report of cultural resource discoveries on the construction site will be prepared and the report will include the evaluation for NRHP eligibility, as appropriate. A monitoring report for this mitigation will be kept on file at the USIBWC Field Office in San Diego, California
- The USIBWC would monitor the preparation of the Paleontological Resource Mitigation Plan to ensure that this mitigation is accomplished in a timely manner for the selected alternative. A monitoring report for this mitigation, and paleontological monitoring of the construction site, will be kept on file at the USIBWC office in San Diego.
- The USIBWC would ensure that noise reduction methods are monitored to ensure that this mitigation is accomplished in a timely manner for the selected alternative. A monitoring report for this mitigation will be kept on file at the USIBWC office in San Diego, California.
- The USIBWC would ensure that confirmatory surveys for least Bell's vireo, southwestern willow flycatchers and raptor nesting are monitored to ensure that this mitigation is accomplished in a timely manner for the selected alternative. A monitoring report for this mitigation will be kept on file at the USIBWC office in San Diego, California.

- The USIBWC would ensure that preservation or restoration of annual grasslands on the Bajagua site is monitored to ensure that this mitigation is accomplished in a timely manner for the selected alternative. A monitoring report for this mitigation will be kept on file at the USIBWC office in San Diego, California.

CHAPTER 6 – COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS IN THE UNITED STATES AND MEXICO

The United States and Mexico have environmental regulations that pertain to the approval of treatment options for the South Bay International Wastewater Treatment Plant (SBIWTP). Subchapter 6.1 presents United States regulations that apply to the treatment alternatives and describes the status of permits that may be required. Potentially applicable Mexican regulations are discussed in Subchapter 6.2. The United States is not required to obtain permits from Mexico for any facilities for the alternatives. Mexican regulations are included as a basis for evaluating impacts to Mexico from implementing any of the alternatives. Because the Public Law 106-457 plant would be in Mexico, the Mexican Government will apply its laws in establishing this facility. Pursuant to Minute 311, the government of Mexico is required to obtain all permits/approvals required by the Mexican authorities.

In addition to applicable regulations, this Supplemental Environmental Impact Statement (SEIS) process has included scoping, notification, and coordination with government agencies and the public. Consultation and coordination activities are described in Chapter 7. Documentation of the public scoping process is provided in Appendix A.

6.1 UNITED STATES REGULATIONS AND PERMITS

6.1.1 Water Resources

6.1.1.1 Surface and Groundwater Quality

Clean Water Act/National Pollutant Discharge Elimination System

Section 402 of the Clean Water Act (CWA) requires the United States Environmental Protection Agency (EPA) to administer the federal National Pollutant Discharge Elimination System (NPDES) permit regulations for certain discharges into United States waters. Water quality is regulated by the NPDES permit program, which controls and reduces pollutants to water bodies from point and nonpoint discharges. In 1990, the EPA promulgated regulations that required municipalities and urban counties with separate storm drainage facilities that serve populations over 100,000 to obtain NPDES permits.

The federal regulations also gave discretionary authority to the state administering agency, the California Regional Water Quality Control Board (CRWQCB), to require smaller municipalities to obtain NPDES permits. In addition, projects that disturb more than 5 acres of land during construction are required to file a Notice of Intent to be covered under the state NPDES General Construction Permit for discharges of stormwater from construction activity. Construction activities associated with small, linear and underground or overhead projects that disturb more than one (1) acre but less than 5 acres are subject to the NPDES Small Linear Underground/Overhead Project (Small LUP) General Permit. These projects are also required to submit an NOI of a Linear Construction Activity Notification (LCAN) to obtain coverage under the Small LUP General Permit for Construction Activities.

An NPDES construction stormwater permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP addresses construction stormwater best management practices (BMP) to be used during construction. BMPs are programs, technologies, operating methods, or other measures that control, prevent, or reduce pollution. Additionally, the SWPPP must contain: a visual monitoring program; a chemical monitoring program for “non-visible” pollutants; and, a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Basin Plan

The CRWQCB Water Quality Control Plan for the San Diego Basin (1995) (Basin Plan) is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (1) designates beneficial uses for surface water and groundwater, (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state’s antidegradation policy, (3) describes implementation programs to protect the beneficial uses of all waters in the region, and (4) describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan. Additionally, the Basin Plan incorporates, by reference, all applicable state and regional board plans and policies.

Beneficial uses are defined as water uses necessary for the survival or well-being of humans, plants, and wildlife. These water uses promote the tangible and intangible economic, social, and environmental goals of humankind.

Beneficial uses for the Tijuana River in the Tijuana River valley west of Interstate 5 include noncontact water recreation, warm freshwater habitat, wildlife habitat; and rare, threatened, or endangered species. The Tijuana River is exempted from the municipal beneficial use designation. Beneficial uses for groundwater in the Tijuana River valley include municipal and domestic supply, industrial service supply, and agricultural supply.

To protect the designated beneficial uses, the CRWQCB has specified water quality objectives. These water quality objectives are described in Chapter 3 of the Basin Plan.

Approvals

An NPDES Construction Stormwater Permit (with a Pollution Prevention Plan) would be required pursuant to Section 402 of the CWA for grading areas of more than one acre, which would be required for all alternatives. Existing permits would not apply to new grading. An NPDES permit would also be required for any dewatering of the project area or nonpoint source runoff that could occur.

6.1.1.2 Marine Water Quality

Regulatory Background

The CWA established requirements for secondary treatment by activated-sludge treatment plants in terms of biochemical oxygen demand (BOD) and total suspended solids (TSS) discharged to surface water. The CWA also established secondary-equivalent standards for trickling filters and pond treatment systems. Other applicable standards are Section 402 of the federal CWA and the California Porter-

Cologne Water Quality Act. The CWA established requirements for discharges to federal ocean waters in Section 503(c) and through the NPDES. For discharges to the ocean, the CWA allows for modifications through the 301 (h) waiver process. The EPA has delegated responsibility for NPDES permitting in California to the CRWQCB.

Through the Porter Cologne Act, the CRWQCB has authority to set waste discharge requirements. For discharges from the SBIWTP through the South Bay Ocean Outfall (SBOO), the CRWQCB is applying the standards from the Ocean Plan. Waste discharge requirements and other NPDES permit requirements were incorporated into a single set of permitting documents that was issued by the CRWQCB in November 1996 (NPDES permit No. CA0108928).

In addition to these acts, the Basin Plan regulates the SBIWTP discharge. The CRWQCB adopted the Basin Plan and the SWRCB approved the plan in 1994. The Basin Plan designates narrative and numerical water quality objectives and prohibitions. It also establishes additional water quality objectives for dissolved oxygen and pH.

California Ocean Plan

The California Ocean Plan was promulgated by the State Water Resource Control Board (SWRCB) to establish water quality standards in accordance with Section 303(c)(l) of the federal CWA and Section 13170.2(b) of the California Water Code. The California Ocean Plan directly applies to state territorial marine waters and optionally applies to discharges outside state territorial marine waters that could affect the quality of state waters. The SBIWTP discharge through the SBOO is subject to the requirements of the California Ocean Plan to ensure that no violation of the water quality objectives and effluent quality requirements occurs in state territorial marine waters.

The California Ocean Plan, as amended in December 2001, defines beneficial uses (Chapter I), water quality objectives (Chapter II), general requirements for management of waste discharge to the ocean (Chapter III), effluent quality requirements (Chapter IV), and discharge prohibitions (Chapter V). The water quality objectives address "... limits or levels of water quality characteristics for ocean waters to ensure reasonable protection of beneficial uses and the prevention of nuisances."

Beneficial Uses

The California Ocean Plan (Ocean Plan) identifies beneficial uses, discharge standards, and receiving water standards for state ocean waters. The Ocean Plan identified these beneficial uses:

- Industrial water supply
- Navigation
- Water contact recreation
- Noncontact water recreation
- Ocean commercial and sport fishing
- Preservation and enhancement of Areas of Special Biological Significance (ASBS)
- Preservation of rare and endangered species
- Marine habitat

- Mariculture
- Fish migration
- Fish spawning
- Shellfish harvesting
- Aesthetic enjoyment

The beneficial uses identified in the Basin Plan are listed in the NPDES permit and are similar to the Ocean Plan beneficial uses.

Water Quality Standards in the Ocean Plan and SBIWTP NPDES Permit

Ocean Plan discharge standards address conventional and toxic water quality parameters. Table A of the Ocean Plan sets numerical limits for oil and grease, suspended solids, settleable solids, turbidity, pH, and toxicity. Unlike the CWA, the Ocean Plan does not establish a discharge limit for BOD. Table B of the Ocean Plan sets the basis for effluent discharge limits for toxic compounds.

The existing SBIWTP NPDES permit established numerical limits for toxic compound concentrations specific to the discharge from the SBIWTP. Those limits are based on the Table B limits and the 100:1 dilution factor. The discharge limits are set at a level that will achieve the Ocean Plan limits outside the zone of initial dilution.

The NPDES permit sets effluent and receiving water standards for bacterial, physical, chemical, biological, and radioactivity characteristics. Some limits are qualitative and others are numerical. Numerical limits are defined for bacteria (total and fecal coliform). The bacterial standards apply in ocean areas where human contact with the water can occur (i.e., coastal and kelp bed zones), and in areas of shellfish harvesting. The CRWQCB has not designated shellfish harvesting areas near the SBIWTP discharge, and bacterial limits for shellfish harvesting do not apply to this discharge.

Table 6.1-1 presents the coliform standards and monitoring requirements in Section C.I.8 of the NPDES permit. The average total coliform density determined at each sampling station must not exceed 1,000 organisms per 100 mL during any 30-day period. Not more than 20 percent of the samples may exceed 1,000 per 100 mL and no single sample (when verified with a repeat sample during a 48-hour period) may exceed 10,000 organisms per 100 mL. Stricter limits for fecal coliform counts are set for samples collected near water-contact and shellfish harvesting areas.

As the NPDES permit stipulates, waste-containing pathogens must be discharged a distance from designated shellfish harvesting and water-contact sport areas that is sufficient to maintain applicable bacterial standards without disinfection (Section B.7). If that distance cannot be achieved, the waste must be discharged as far as possible from use areas and reliable disinfection must be applied. The disinfection method should not increase effluent toxicity and should result in the least hazard to human health and the environment.

Table 6.1-1. California Ocean Plan Water Quality Objectives for Total and Fecal Coliform

Area	Total Coliform	Fecal Conform
Water-Contact Standards	1,000 per 100 mL (10 per mL)	Minimum of 5 samples in a 30-day period not to exceed the geometric mean of 200 per 100 mL (2 per mL)
	Not more than 20 percent of samples in a 30-day period > 1,000 per 100 mL	Not more than 10 percent of samples in a 60-day period > 400 per 100 mL (4 per mL) ml
	No single sample (when verified within 48 hours with a repeat sample) > 10,000 per 100 mL (100 per mL)	--
Shellfish Standards[a]		Median density not > 70 per 100 mL (0.7 per mL)
		Not more than 10 percent of samples > 230 per 100 mL (2.3 per mL)

[a]Applicable to designated shellfish harvesting areas only; such areas are designated in the vicinity of the SBOO.

If coliform standard exceedances occur, the enterococcus density will be determined at all stations where coliform samples are collected (Section C.1b). If a shore station consistently exceeds a coliform objective or a geometric mean enterococcus density (24 organisms per 100 mL for a 30-day period or 12 organisms per 100 mL for a 6-month period), the CRWQCB may require the discharger to participate in a survey to determine the source of contamination. The CRWQCB may require the discharger and any other responsible parties it identifies to take action to control a controllable source of indicator organisms identified during a sanitary survey.

The Monitoring and Reporting Program No. 96-50 issued jointly with the NPDES permit stipulates requirements for monitoring influent, sludge, effluent, and receiving water (Sections B through E).

- Influent is monitored weekly for conventional constituents, inorganic, and organic parameters.
- Sludge is tested twice each year for pollutants listed in Section 307 (a) of the CWA, Title 22 CCR, and 40 CFR 503.
- Effluent testing requires daily monitoring of conventional parameters, weekly testing of inorganic (and select organic) parameters as well as acute and chronic toxicity, and monthly analysis for organic constituents.
- Receiving water monitoring requires sampling of water, sediments, and biological samples. Water samples will be used to determine coliform density as discussed above, as well as the monthly testing of conventional pollutants. Benthic monitoring involves the quarterly testing of sediment samples for sediment-specific parameters (e.g., total organic carbon), metals, and organic constituents. Biological monitoring consists of the collection of benthic infaunal samples to determine the integrity of marine invertebrate communities. Furthermore, annual

aerial photography surveys are required to measure changes, if any, in the kelp beds along the San Diego coastline.

Physical standards are set qualitatively without numerical limits. The discharge of waste must not cause aesthetically undesirable discoloration of the ocean surface or floating particulates, oil, or grease. Natural light must not be significantly reduced at any point outside the initial dilution zone. The deposition rate for inert solids and the characteristics of the inert solids in ocean sediments must not be changed in a way that degrades the benthic communities. Of all the standards, only those that limit impacts to the physical quality of the water are used as criteria in Subchapter 3.2.4 of this Draft SEIS (Marine Water Quality). Standards limiting the impacts to benthic communities are applied in Subchapter 3.3.3 for marine biological resources.

The Ocean Plan also sets standards for chemical characteristics, some of which are qualitative and other numerical. The dissolved oxygen concentration must not be depressed more than 10 percent from naturally occurring concentrations. The pH must not be altered more than 0.2 unit from natural levels. Dissolved sulfide in the water near sediments must not increase significantly. Concentrations of Table B substances and organic materials within the sediment must not increase to levels that would degrade indigenous biota or marine life. Nutrients must not cause objectionable aquatic growth or degrade indigenous biota.

In addition to the standards set by the Ocean Plan, the NPDES permit has established monthly average numerical limits for BOD as expressed by 5-clay carbonaceous biochemical oxygen demand (CBOD) (25 mg/L), TSS (30 mg/L), oil and grease (25 mg/L), and many toxic compounds. The numerical limits for the first three parameters are based on the operation of an activated sludge secondary treatment plant. The limits for the toxic compounds are derived from the Table B limits, taking into account the 100:1 dilution factor that will occur in the zone of initial dilution.

The permit incorporates discharge conditions based on the CRWQCB requirement to develop and implement limits for influent concentrations of pollutants that could interfere with plant processes, pass through the plant without removal, or risk worker health and safety. This requirement is the basis for an industrial pretreatment program. The lead agencies developed a headworks allocations analysis for the advanced primary treatment plant to respond to this requirement (Malcolm-Pirnie, 1997). In this allocations study, 20 primary and 12 secondary pollutants of concern were identified after comparing raw wastewater samples to regulatory criteria for effluent and sludge quality. Those criteria were used to develop influent concentrations known as maximum allowable headworks loading (MAHL). The MAHLs were calculated for 16 primary pollutants of concern: arsenic, beryllium, cadmium, chromium, copper, cyanide, iron, lead, mercury, nickel, selenium, silver, zinc, tetrachloroethylene, phenols, and lindane. Four of the compounds (carbon disulfide, aldrin, DDT, and PAHs) underwent an alternative analysis to develop limits.

Sensitivity and achievability analyses were conducted to determine the margin of safety between the MAHLs and the actual concentrations of these compounds in the raw wastewater. Twelve of the pollutants were identified as Class I or Class II pollutants because their influent loadings approached or exceeded the MAHLs, or because they are listed in the National Pollutant Pretreatment Program. A 25 percent safety factor was developed as a buffer between the MAHLs and the Class I and Class II pollutant concentrations that could be allowed into the treatment plant to account for unusual conditions. Aldrin, DDT, PAHs, and carbon disulfide are four pollutants for which MAHL limits could not be set. Because these compounds represent risks, however, they were retained as Class III pollutants. The following monitoring levels were identified for these compounds: (1) monthly influent monitoring for PAHs, and (2) weekly monitoring for Class I, Class II, and two Class III pollutants (Aldrin and DOT). The monitoring frequency for sludge was identified as twice per year for Class I and Class II pollutants.

NPDES Permit Status

The CRWQCB issued an NPDES permit for compliance with Section 402 and Ocean Plan standards on November 14, 1996 (permit No. CA108928). The NPDES permit for the SBIWTP authorizes discharge from a secondary wastewater treatment plant using activated sludge. The Regional Board also issued Cease and Desist Order (CDO) 96-52 to prohibit discharge of sewage to the Tijuana River from the SBIWTP and associated facilities, to establish a time schedule for achieving compliance with the effluent limitations in Order No. 96-50, to establish interim advanced primary treatment effluent limitations, and to establish an interim flow rate prohibition (RWQCB, 2003b). The Regional Board also issued three addendums to CDO 96-52:

- The first addendum, issued May 13, 1998, established a new compliance schedule for completing the Final SEIS, a signed ROD, and construction of the ocean outfall.
- The second addendum, issued October 14, 1998, established a compliance schedule for acute toxicity, required the submission of a toxicity identification evaluation report and schedule for selecting, installing, and implementing secondary treatment, and a ROD.
- The third addendum, issued November 8, 2000, stipulated penalties for failing to complete secondary treatment facilities and comply with effluent limits of the NPDES permit (Order 96-50) by December 31, 2000.

Technical Change Order to Monitoring and Reporting Program (MRP) No. 96-50 revised the schedule for submitting monitoring reports and modified 1998 schedules for weekly and monthly constituent sampling.

The first addendum to MRP No. 96-50 established advanced primary treatment influent limitations for 12 primary pollutants of concern and identified four other pollutants of concern to be monitored and evaluated in the future for potential risks and health and safety concerns. The second addendum established a compliance schedule for completing the headworks allocation studies for SBIWTP primary and secondary treatment facilities (RWQCB, 2003a).

The permit must be renewed every 5 years. The USIBWC submitted an application for renewal of the NPDES permit in April 2001.

Approvals

Section D.4.a - e of the NPDES requires dischargers to file a new report of waste discharge not less than 180 days prior to any material change in the character, location, or volume of wastewater including, but not limited to an increase in the flow beyond that specified in the waste discharge requirement (i.e., 25 mgd) and/or a significant change in the disposal area (e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems).

A new report of waste discharge would be required for Alternatives 2, 3 4 and 6 because these project alternatives would either change the current volume of wastewater discharged through SBOO and/or discharge to a disposal area (i.e., Punta Bandera).

6.1.2 Biological Resources

Several federal and state laws protect rare, threatened, and endangered flora and fauna. Brief summaries of these laws are presented in the following paragraphs.

6.1.2.1 Federal Statutes and Regulations

The Endangered Species Act (ESA) aims to conserve the nation's natural heritage for the enjoyment and benefit of current and future generations. The United States Fish and Wildlife Service (USFWS) coordinates ESA activities for terrestrial and freshwater species, while the National Marine Fisheries Service (NMFS) is responsible for marine and anatropous [1] species. The ESA provides for the conservation of species that are in danger of extinction throughout all or a significant portion of their range. Section 9 of the ESA prohibits the *taking* of any listed species. ESA Section 7 requires any federal agency to consult with the USFWS or NMFS before undertaking action that might adversely affect a listed species.

Under Sections 401 and 404, the Clean Water Act regulates point and non-point source pollution and, along with Executive Order 11990 titled Protection of Wetlands, impacts to wetlands. Administration of Section 401 of the Act is delegated to the state Regional Water Quality Control Board. Regulatory authority has been delegated by the Environmental Protection Agency (EPA) to the United States Army Corps of Engineers (USACE) for Section 404. Section 404 of the Clean Water Act (CWA) regulates the discharge of dredge or fill material into waters of the United States and Adjacent wetlands. Before the USACE can issue a Section 404 permit for a project that could impact a listed species, it must obtain a Biological Opinion from the USFWS or NMFS stating that authorizing the project will "not jeopardize the continued existence of that species."

The Marine Mammal Protection Act (MMPA) establishes a federal responsibility to conserve marine mammals (i.e., sea otter, polar bear, dugong, manatee, cetaceans, and pinnipeds) and prohibits their taking and harassing. Statutes define taking as any action that would "harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill" of marine mammals or their stock as indicated by behavioral changes (e.g., in breeding, breathing, feeding, sheltering). The USFWS comments under the Fish and Wildlife Coordination Act on federal projects and permits and licenses affecting sea otter, walrus, polar bear, dugong, and manatee. For marine mammals, the ESA and the MMPA offer similar management authority for endangered and threatened species or their stocks. Consultation occurs under Section 7 with federal agencies to avoid, minimize, or mitigate the impacts of their activities on listed species.

The Migratory Bird Treaty Act (MBTA) implements international treaties among the United States, Mexico, and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing,

[1] An organism lacking the power of locomotion

killing, selling, and shipping unless expressly authorized in the regulations or by permit. A list of birds covered by the Act is contained in 50 CFR 10.

6.1.2.2 State Statutes and Regulations

The California Endangered Species Act (CESA) generally parallels the main provisions of the federal ESA. CESA prohibits the taking of listed species except as otherwise provided in state law and requires consultation to implement public projects that could impact protected species or their habitat. Unlike its federal counterpart, CESA applies the take prohibitions to species petitioned for listing (state candidates). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations.

The California Ocean Plan sets biological characteristics and quantitative standards. Marine communities (vertebrates, invertebrates, and plant species) must not be degraded. The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption must not be altered. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption must not bioaccumulate to levels harmful to human health. The single standard for radioactivity states that radioactive waste must not degrade marine life.

6.1.2.3 Approvals

Federal Coordination

None of the project alternatives would adversely affect a federally-listed or state-listed species. The Biological Opinion developed for initial construction of the treatment plant has no expiration date. If Section 7 consultation is required, a revised Biological Opinion for this SEIS could be issued.

State Coordination

A 2080 permit for protecting state-listed endangered species is not expected to be required for treatment alternatives evaluated herein. The CDFG did not require a 2080 permit for previous actions; rather, the USFWS Biological Opinion was determined by the state to be adequate.

6.1.3 Cultural and Paleontological Resources

6.1.3.1 Historical Sites

Federal actions are subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (36 CFR 800.1). The federal agency involved in the proposed action is required, in consultation with the State Historic Preservation Officer (SHPO), to make a reasonable and good-faith effort to identify historic properties that may be affected by the undertaking and to gather sufficient information to evaluate the eligibility of the properties for the National Register of Historic Places (NRHP) (36 CFR 800.4). The basic steps in the Section 106 process are:

- Identify and evaluate properties within a project's area of potential effect (APE) for eligibility for NRHP listing [36 CFR 60.4]

- Assess the project's effects on cultural resources listed or determined eligible for listing on the NRHP [36 CFR 800.9(a)]

Under 36 CFR 800.9(a), a project is considered to have an effect on a historic property if the project will alter features of the property's location, setting, or use in determining NRHP eligibility. If no project-related effect is found to exist, a No Effect Determination is made. If an effect is found, Criteria of Adverse Effect [36 CFR 800.9 (b)] are applied.

6.1.3.2 Approvals

As a federal undertaking, this project is subject to Section 106 of the NHPA. This USIBWC will be required to initiate a Section 106 consultation process for the selected alternative.

6.1.4 Land Use

NEPA requires that an EIS discuss: (1) "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local... land use plans, policies, and controls for the area concerned" [40 C.F.R. § 1502.16(c)]; and, (2) "any inconsistency of a proposed action with any approved State or local plan and laws" and, where such an inconsistency exists, "describe the extent to which the agency would reconcile its proposed action with the plan or law" [40 C.F.R. § 1506.2(d)].

6.1.4.1 Regulations

Land use plans and policies that apply to the project alternatives include:

- Coastal Zone Management Act
- California Coastal Act
- Tijuana River Valley Plan and Local Coastal Program Addendum
- City of San Diego Sub-Area Plan for the Multi-Species Conservation Program
- Tijuana River National Estuarine Sanctuary Management. Plan
- Concept Plan for the Tijuana River Valley Regional Open Space Park

The Coastal Zone Management Act (CZMA) requires federal permit applicants to obtain a certification verifying that activities proposed in the "coastal zone" are consistent with state coastal zone management programs, e.g., federal CWA and §404 applicants. The CZMA creates a broad program based on land development controls in coastal zones, incorporating state involvement by developing programs for comprehensive state management. The CZMA also requires federal agencies or licensees to carry out their activities so that they conform as much as practicable with a state's coastal zone management program.

The California Coastal Act (CCA) is California's coastal zone management program. The CCA establishes California Coastal Commission (CCC) as having jurisdiction over California's "coastal zone." The CCC may be called on to review several types of federal projects that encompass:

- Development projects undertaken by a federal agency
- An activity conducted or supported by a federal agency
- Activities by private parties authorized by a federal agency's issuance of licenses and permits

The consistency of the project alternatives with local land use plans and policies is discussed in Subchapter 3.8.

6.1.4.2 Approvals

As discussed in Subchapter 4.7, the alternatives are consistent with all plans and policies.

Project alternatives 4, 5 and 6 would require a finding of consistency with the CCA. The lead agencies will submit a new Coastal Consistency Determination (CCD) prior to implementation of either of these alternatives. The Commission could then concur or object to the action. The previous CCD and Negative Determinations would be referenced.

6.1.5 Public Health and Safety (Hazardous Wastes)

6.1.5.1 Regulations

Federal

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), 42 USC Section 9601 *et seq.* 40 CFR 302 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Emergency Planning and Community Right-to-Know Act of 1986 (SARA Title 111). 42 USC Section 11001 *et seq.*; 40 CFR Parts 350, 355 and 370. CERCLA prescribes that the National Response Center be notified for any release of a reportable quantity of a hazardous substance (42 USC Section 9603). CERCLA also specifies notification requirements for any potentially injured parties in connection with any such release (42 USC Section 9611 (g). Requirements for demonstration of financial responsibility in connection with the storage of hazardous substances are also mandated through CERCLA (42 USC Section 9608(b).

Superfund regulations define “hazardous substance” as any material identified in 42 USC Section 9601 (14) (Section 101). EPA regulations at 40 CFR 302.4, Table 3.2-4, set forth the list of hazardous substances under CERCLA and reportable quantities for each substance.

Superfund Amendment and Reauthorization Act (SARA) Title III established a nationwide emergency planning and response program and imposed reporting requirements for businesses, which store, handle, or produce significant quantities of hazardous or toxic substances above certain threshold quantities as defined under federal laws. This law requires states to implement a comprehensive system to inform federal authorities, local agencies, and the public when a significant quantity of hazardous toxic substance is stored or handled at a facility. In California, many SARA requirements are reflected in Chapter 6.95 of the California Health and Safety Code.

29 USC Section 65129; 29 CFR 1910 *et seq* and 1926 *et seq.* These sections contain requirements for equipment used to store and handle hazardous materials. This regulation also defines requirements for equipment necessary to protect workers in the event of emergencies. This regulation is designed primarily to protect worker health, but also contains requirements that affect general facility safety. The California regulations contained in Title 8 (California equivalent of 29 CFR) are generally more stringent than those contained in Title 29.

State

8 CCR Section 339; Section 3200 *et seq.*, Section 5139 *et seq.* and Section 5160 *et seq.* 8 CCR Section 339 lists hazardous chemicals in accordance with the Hazardous Substance Information and Training Act (HSITA). 8 CCR Sections 3200 *et seq.* and 5139 *et seq.* address control of hazardous substances. 8 CCR Section 5160 *et seq.* addresses hot, flammable, poisonous, corrosive, and irritant substances.

California Health & Safety Code, Division 20, Chapter 6.95. Chapter 6.95 of the Health & Safety Code establishes minimum statewide standards for Hazardous Materials Business Plans. Business Plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state. Each business is required to prepare a Business Plan if that business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following:

- 500 pounds of a solid substance
- 55 gallons of a liquid
- 200 cubic feet of compressed gas
- A hazardous compressed gas in any amount
- Hazardous waste in any quantity (to meet the requirements for emergency contingency plans)

The administering agency for the state regulations is the Hazardous Materials Division (HMD) of the County of San Diego Department of Environmental Health (DEH). HMD is the Certified Unified Program Agency (CUPA) for San Diego County responsible for regulating hazardous materials business plans and chemical inventory, hazardous waste and tiered permitting, underground storage tanks, and risk management plans.

6.1.5.2 Approvals

If hazardous waste is generated while constructing or operating an alternative, the wastewater treatment facility would be required to comply with any applicable regulations requiring permits, plans (e.g., emergency preparedness), recordkeeping, training (e.g., preparing hazardous waste manifests, hazardous waste management), and containment (e.g., for storage).

6.1.6 Air Quality

6.1.6.1 Federal Clean Air Act

The federal Clean Air Act was enacted in 1970 and amended in 1977 and 1990 [42 U.S.C. 7506(c)]. In 1971, the EPA promulgated national ambient air quality standards. The six pollutants of primary concern for which national standards are established are sulfur dioxide, lead, carbon monoxide, nitrogen dioxide, ozone, and suspended particulate matter.

California has adopted stricter standards than the EPA. In San Diego, the Air Quality Attainment Plan (AQAP) is the 1991/1992 Regional Air Quality Strategies (RAQS) and transportation control measures (TCM).

The EPA allows states the option to develop different (i.e., stricter) standards, which the California Air Resources Board (CARB) has adopted. Table 6.1-2 shows federal and California standards for air quality.

Table 6.1-2. State and Federal Ambient Air Quality Standards Maximum Concentration Averaged Over Specified Time Period

Pollutant	State Standard	Federal Standard
Oxidant (ozone)	0.09 ppm (180 μg/m^3) 1 hr	0.12 ppm (235 μg/m^3) 1 hr
Carbon monoxide	9.0 ppm (10 mg/m^3) 8 hr	9 ppm (10 mg/m^3) 8 hr
	20.0 ppm (23 mg/m^3) 1 hr	35.0 ppm (40 mg/m^3) 1 hr
Sulfur dioxide	0.04 ppm (105 μg/m^3) 24hr	0.03 ppm (80 μg/m^3) annual average
Nitrogen dioxide	0.25 ppm (470 μg/m^3) 1 hr	0.053 ppm (100 μg/m^3) annual average
Oxidant (ozone)	0.09 ppm (180 μg/m^3) 1 hr	0.12 ppm (235 μg/m^3) 1 hr
Lead	1.5 μg/m^3 30-day average	1.5 μg/m^3 calendar quarter
Suspended particulate matter (PM_{10})	50 μg/m^3 24 hr	150 μg/m^3 24 hr

Source: State of California, 1994
μg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

The San Diego Air Pollution Control District (APCD), which regulates air quality in the San Diego Air Basin (SDAB), prepared the updated 1991/1992 RAQS to respond to the requirements of Assembly Bill (AB) 2595. The updated draft was adopted, with amendments, on June 30, 1992 (County of San Diego, 1992). The required triennial update of the RAQS was adopted on December 12, 1995. The RAQS and TCM plan set forth the steps to achieve state and federal ambient air quality standards.

The San Diego APCD also established rules and regulations initially adopted on January 1, 1969. The rules and regulations, reviewed and updated periodically, define requirements regarding stationary sources of air pollutants and fugitive dust.

6.1.6.2 USEPA General Conformity Rule

Based on the requirements outlined in the USEPA General Conformity Rule published in 58 Federal Register 63214 (November 30, 1993) and codified at 40 CFR Part 93, Subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the threshold emission limits (i.e., *de minimis*) that trigger the need to conduct a formal conformity determination. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken. This rule establishes a process for analyzing and determining whether a proposed project in a nonattainment area conforms to the applicable State Implementation Plan (SIP) and federal standards. A federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria air pollutant. If a federal action meets *de minimis* requirements and is not considered a regionally significant action, then a full conformity determination is not required. Ongoing activities currently being conducted are exempt from the rule as long as there is no increase in emissions equal to or greater than above the *de minimis* levels as the result of the federal action. As stated in Subchapter 3.5.2, the San Diego Air Basin is designated as a nonattainment area for the 8-hour ozone standard. The *de minimis* limit of ozone is 100 tons per year. Regional significance would be 10 percent of AQCR 29 (San Diego County) emissions or 20.3 tons for VOC and 20.4 tons for NO_X.

As indicated in Tables 4.5-1 through 4.5-8, emissions from Alternatives 3 through 6 would fall below the 10 percent level that would be considered regionally significant by the USEPA. Additionally, none of the emissions from treatment alternatives evaluated would exceed *de minimis* levels for any criteria pollutant. Thus, a Conformity Determination would not be required.

6.1.6.3 California Air Resource Board Guidelines

For short-term emissions of criteria pollutants (e.g., construction emissions), the South Coast Air Quality Management District (SCAQMD) has established daily emissions significance thresholds (see Table 6.1-3). The San Diego APCD has generally accepted these thresholds.

Table 6.1-3. Significance Thresholds

Source and Pollutant	Threshold
Construction	
ROC	2.5 tons/qtr or 75 lb/day (2.3 tons/qtr or 28 kg/day)
NO_X	2.5 tons/qtr or 100 lb/day (2.3 tons/qtr or 37.3 kg/day)
CO	24.75 tons/qtr or 550 lb/day (22.5 tons/qtr or 205 kg/day)
PM_{10}	6.75 tons/qtr or 150 lb/day (6.1 tons/qtr or 56 kg/day)
SO_X	6.75 tons/qtr or 150 lb/day (6.1 tons/qtr or 56 kg/day)
Operation	
ROC	55 lb/day (20.5 kg/day)
NO_X	55 lb/day (20.5 kg/day)
CO	550 lb/day (205 kg/day)
PM_{10}	150 lb/day (56 kg/day)
SO_X	150 lb/day (56 kg/day)

Source: SCAQMD, 1993 (Tables 6-2 and 6-4)

ROC = reactive organic compounds; NO_X = nitrogen oxides; CO = carbon monoxide
PM_{10} = 10-micron participates; SO_X = sulfur oxides

The California Environmental Quality Act (CEQA) Air Quality Handbook (SCAQMD, 1993) also provides a screening table to determine whether a proposed project could generate construction-related emissions that exceed the standards. For long-term emissions of criteria pollutants, the direct impacts of a project can be measured by the degree to which the project is consistent with regional plans to improve and maintain air quality. The regional plan for San Diego is the 1991/1992 RAQS and attached TCM plan. The CARB provides criteria for determining whether a project conforms with the RAQS (State of California, 1989), including the following provisions:

- Is a regional air quality plan implemented in the project area?
- Is the project consistent with the growth assumptions in the regional air quality plan?

- Does the project incorporate all feasible and available air quality control measures?

The project alternatives are in the SDAB, which is covered by the 1991/1992 RAQS as described above. In addition, no proposed alternative is growth inducing; therefore, Criteria 1 and 2 above are satisfied. Air quality control measures are discussed in Chapter 5 of this Draft SEIS. The San Diego APCD issues air quality permits for operation of the SBIWTP.

Odor emissions fall under the APCD “nuisance” rule and are not subject to quantitative regulations. The SCAQMD would investigate complaints about odor to determine whether air quality rules have been violated.

6.1.6.4 Approvals

The construction contractor would be responsible for obtaining a valid authority-to-construct permit before construction begins.

The SBIWTP has an air permit for current operations, but expanding operations under any alternative would require that the permit be modified. The air quality control measures employed for each alternative are discussed in Chapter 5 of this Draft SEIS.

6.1.7 Noise

The City of San Diego has established a noise ordinance to regulate construction and operation noise on various types of land uses (City of San Diego, 1984 and 1985). According to Section 59.5.0404 of the ordinance, the specified noise level standard for construction near residential receptors is 75 decibels (dBA) L_{eq}. This noise level limit is a 12-hour average for the hours between 7:00 a.m. and 7:00 p.m. and is applied at the residential property line through the surrounding areas.

For operational noise, the City of San Diego’s noise ordinance specifies 1-hour average noise level limits for noise produced at the boundaries of different land uses. Agricultural and manufacturing land has a noise level limit of 75 dBA L_{eq} for any hour of the day. Residential areas zoned R-2 have a 1-hour average noise level limit of 55 dBA L_{eq} from 7:00 a.m. to 7:00 p.m., 50 dBA L_{eq} from 7:00 p.m. to 10:00 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m.

Traffic noise standards are established by the City of San Diego Noise Element of the General Plan. The transportation noise standard for residential properties is 65 dBa Community Noise Equivalent Level (CNEL). For industrial and agricultural areas, the transportation noise level standard is 75 CNEL.

As described in Subchapter 4.5 of this Draft SEIS, all alternatives are expected to comply with the City of San Diego noise ordinance and General Plan noise standard. No approvals related to noise would be required.

6.2 MEXICAN REGULATIONS AND PERMITS

Mexican regulations are described herein to provide a basis for evaluating the impacts of the alternatives in Mexico. The Mexican Government, however, would be required to comply with its own laws in establishing a secondary treatment plant and associated pipelines/pump stations in Mexico; refurbishing Mexico’s original conveyance channel to the SABWWTP, or any other project related to facilities in Mexico.

This subchapter summarizes available Mexican environmental law. Two sources were consulted:

- The publication "Environmental Management for Mexican Industry (including Maquiladoras)" (Stuckey and Monasterio, 1997)
- The Internet website of the Commission for Environmental Cooperation (CEC) concerning Mexican laws and standards

Additional information was obtained from the SWRCB and from CH2M Hill.

6.2.1 Legal Framework

Mexico's first environmental law was passed in 1972, then was superseded by passage of the General Law on Ecological Equilibrium and Environmental Protection (Ley General del Equilibrio Ecologico y la Proteccion al Ambiente, or LGEEPA) on January 28, 1988. LGEEPA was amended in 1996 by the Environment, Natural Resources, and Fisheries Secretariat (Secretaria del Medio Ambiente, Recursos Naturales y Pesca, or SEMARNAP), the Mexican federal agency equivalent to the United States EPA. The law protects natural biological resources and water and air quality; regulates hazardous substances and uses of nuclear power; addresses nuisances such as noise, odors, and visual impacts; and describes requirements for social participation and the distribution of environmental information. LGEEPA also encompasses the Official Mexican Standards (Norma Oficial Mexicanas, or NOMs) devised by SEMARNAP and other environmental resource agencies, such as the National Water Commission (Comision Nacional del Agua, or CNA).

6.2.2 New Facility Environmental Review and Permitting Process

A new facility in Mexico requires an application to be prepared for facility construction. This application is filed with the SEMARNAP or with the State Department of Ecology (Direccion General de Ecologia, or DGE). Filing the application with DGE is a direct result of the decentralization process for the federal agency SEMARNAP. This is the case for the sludge disposal facility for the biosolids produced by the SBIWTP to be disposed in the City of Tijuana. After reviewing the application, the DGE may require an Environmental Assessment Document (Manifestacion de Impacto Ambiental, or MIA) to describe operation of the facility processes, identify potential environmental impacts, and recommend mitigation measures to minimize environmental impacts. In addition, if the facility operations are considered to pose a risk as a result of hazardous materials handling, the DGE may require a risk assessment study. Based on the information provided, the DGE may approve, conditionally approve, or report the proposed operation. Operations permits are valid for one year.

6.2.2.1 Permits/Approvals

Operating facilities must be issued an Environmental Permit by SEMARNAP through the Integrated System of Direct Regulations and Environmental Procedures. The system encompasses:

- A one-step environmental license, which is essentially an operating permit containing provisions for water use, wastewater discharge, air emissions, and the generation/management of hazardous waste. This permit is required for new facilities and for existing facilities planning changes in facility operations or structure (e.g., in process, location, or equipment).
- An environmental performance report, which is prepared annually and contains data on air emissions, and on the generation and disposal of wastewater and hazardous waste.
- A voluntary program for environmental procedures, which is a self-regulation tool aiming "to promote the development of the industrial environmental procedures capacity to achieve an integral, continuous, increasing, and voluntary protection of the environment" (ERM, 1997).

A registration requirement exists for hazardous waste handling facilities. A hazardous waste registration is required if a facility manages hazardous waste. Stipulations include implementing a hazardous waste training program, documenting accreditation of a hazardous waste technician, and an emergency response program for hazardous waste.

6.2.3 Wastewater Regulations

The regulations concerning wastewater would apply to a facility in Mexico that discharges wastewater to a water body or to the municipal sewer.

6.2.3.1 Permits/Registrations

The regulations differentiate between wastewater discharges to the municipal sewers and those leading to national bodies of water and properties. For the former, a Wastewater Discharge Registration Application must be submitted to the appropriate municipality to register the discharge. The latter must be authorized by CNA through approval of the Wastewater Permit Application and registered for fee payment through the Fee Registration Application.

Industrial discharges must request that the CNA issue a Particular Conditions of Discharge (CPD) including parameter-specific discharge limits and frequency of sampling, analysis, and reporting. These discharge conditions may be more stringent than the NOMs limits.

Fees assessed for discharges may be waived if the two CPDs or applicable NOMs are met. Fees may be waived for up to two years if a schedule, plan, and budget for addressing the discharge quality are submitted to CNA with a request to approve the waiver of fees.

6.2.3.2 NOMs

NOMs include:

- Maximum permissible limits of pollutants in wastewater discharges into national bodies of water and properties (NOM-001-ECOL-1996).

- Maximum permissible limits of pollutants in wastewater discharges from industry, agroindustrial activities, sendees, and wastewater treatment to urban or municipal drainage and sewerage systems (NOM-031-ECOL-1993). Table 6.2-1 lists discharge limits to municipal sewer systems.

- CPDs may have more stringent limits than those in Table 6.2-1 or in addition to them. These conditions include discharge limits for:

  - Color
  - Total phosphorous
  - Sulfides
  - Total nitrogen
  - Alkalinity
  - Total dissolved solids
  - Toxic organics
  - Biochemical oxygen demand
  - Chemical oxygen demand total suspended solids
  - Heavy metals not included in NOM-Q31
  - Hydrocarbons not included in toxic organics

- Ecological criteria for water quality (CE-001789)

On January 6, 1997, SEMARNAP published the NOM-001-ECOL-1996. This NOM revised allowable limits of contaminants in wastewater discharged directly into national waters, including rivers, artificial and natural lakes, ocean waters, agricultural irrigation, and into wetlands. NQM-001-ECOL-1996 replaced all the "categorical NOMs" set in previous years for specific industries (e.g., NOM-005-ECOL-1993, which established the maximum allowable discharge limits for contaminants in wastewater from the fabrication of plastics and synthetic polymers, was replaced). The compliance schedules for municipal and nonmunicipal wastewater discharges to national waters are shown in Tables 6.2-2 and 6.2-3, respectively. Tables 6.2-4 and 6.2-5 show the applicable limits for discharge to coastal waters.

Table 6.2-1. Wastewater Discharge NOM-031-ECOL/1993 Standards for General Industry

Parameters	Maximum Permissible Limits	
	Daily Average	Instantaneous
Temperature–Celsius		40.00
pH Units	6-9	6-9
Settleable Solids (m/L)	5.00	10.00
Oils and Greases (mg/L)	60.00	100.00
Conductivity (micro mhos/cm)	5000	8000
Aluminum (mg/L)	10.00	20.00
Arsenic (mg/L)	0.5	1.00
Cadmium (mg/L)	0.50	1.00
Cyanide (mg/L)	1.00	2.00
Copper (mg/L)	5.00	10.00
Hexavalent Chromium (mg/L)	0.50	1.00
Total Chromium (mg/L)	2.50	5.00
Fluoride (mg/L)	3.00	6.00
Mercury (mg/L)	0.01	0.02
Nickel (mg/L)	4.00	8.00
Silver (mg/L)	1.00	2.00
Lead (mg/L)	1.00	2.00
Zinc (mg/L)	6.00	12.00
Phenols (mg/L)	5.00	10.00
Methylene — Blue Reactive Substances (mg/L)	30.00	60.00

*Not NOM-031-ECOL/1993 parameters. These are typical values assigned by CNA for direct discharges.

Table 6.2-2. Compliance Schedule for Municipal Discharges to National Waters under NOM-001-ECOL-1996

Date of Compliance	Population
January 1, 2000	>50,000
January 1, 2005	> 20,001-50,000
January 1, 2010	>2,501-20,000

Table 6.2-3. Compliance Schedule for Nonmunicipal Discharges to National Waters under NOM-001-ECOL-1996

Date of Compliance	Mass Loading	
	BOD, tons/day	TSS, tons/day
January 1, 2000	>3.0	>3.0
January 1, 2005	>1.2 to 3.0	>1.2 to 3.0
January 1, 2010	< 1.2	< 1.2

Table 6.2-4. Monthly and Daily Concentration Limits for Conventional Contaminants Discharged to Coastal Waters NOM-001-ECOL-1996

Parameters mg/L[1]	Coastal Waters					
	Fishing, Navigation, and Other Uses		Recreation		Estuaries	
	Monthly Average	Daily Average	Monthly Average	Daily Average	Monthly Average	Daily Average
Temperature, °C	40	40	40	40	40	40
Grease and Oils	15	25	15	25	15	25
Floating Material	ND	ND	ND	ND	ND	ND
Total Settleable Solids (ml/L)	1	2	1	2	1	2
Total Suspended Solids	100	175	75	125	75	125
BOD_5	100	200	75	150	75	150
Total Nitrogen	--	--	--	--	15	25
Total Phosphorous	--	--	--	--	5	10

ND = not detectable
[1]Except where indicated

Table 6.2-5. Monthly and Daily Concentration Limits for Heavy Metals and Cyanide Discharged to Coastal Waters NOM-001-ECOL-1996

Parameters mg/L[1]	Coastal Waters					
	Fishing, Navigation, and Other Uses		Recreation		Estuaries	
	Monthly Average	Daily Average	Monthly Average	Daily Average	Monthly Average	Daily Average
Arsenic	0.1	0.2	0.2	0.4	0.1	0.2
Cadmium	0.1	0.2	0.2	0.4	0.1	0.2
Cyanide	2.0	2.0	2.0	3.0	1.0	2.0
Copper	4.0	6.0	4.0	6.0	4.0	6.0
Chrome	0.5	1.0	1.0	1.5	0.5	1.0
Mercury	0.01	0.02	0.01	0.02	0.01	0.02
Nickel	2.0	4.0	2.0	4.0	2.0	4.0
Lead	0.2	0.4	0.5	1.0	0.2	0.4
Zinc	10.0	20.0	10.0	20.0	10.0	20.0

ND = not detectable
[1]Except where indicated

In addition to the parameters in Tables 6.2-4 and 6.2-5, the following NOM-001-ECOL-1996 limits must be met for pH, pathogens, and parasites:

- pH should be between 5 and 10.
- Daily average fecal coliform limit of 2,000 (most probable number per 100 milliliters [MPN/l00 mL]).

- Monthly average fecal coliform limit of 1,000 (MPN/100 mL).
- One helminth egg per liter for effluent used in restricted irrigation or 5 helminth eggs per liter for effluent used in nonrestricted irrigation.

SEMARNAP has revised the discharge limits for discharges to municipal wastewater collection systems. A draft of the new limits was issued on January 9, 1997, in NOM-002-ECOL-1996. Table 6.2-6 shows the compliance schedule for discharges regulated by NOM-002-ECOL-1996. Table 6.2-7 shows the maximum permissible limits for contaminants in the wastewater discharged to a municipal sewer collection system.

Table 6.2-6. Compliance Schedule for Discharges to Wastewater Collection Systems NOM-002-ECOL-1996

Date of Compliance	Population
January 1, 1999	50,000
January 1, 2004	20,000
January 1, 2009	≥ 2,500

Table 6.2-7. Maximum Allowable Discharge Limits for Conventional Contaminants to Wastewater Collection Systems NOM-002-ECOL-1996

Parameter	Monthly Average mg/L	Daily Average mg/L
Grease and Oils	50.0	100.0
Settleable Solids (ml/L)	5.0	10.0
Arsenic	0.5	1.0
Cadmium	0.5	1.0
Cyanide	1.0	2.0
Copper	10.0	20.0
Chromium	2.5	5.0
Mercury	0.01	0.02

In addition to the parameter concentrations in Table 6.2-7, the following limits apply under NOM-002-ECOL-1996:

- pH must be between 6 and 10.
- Maximum instantaneous temperature is 40°C, but higher temperatures may be allowed if a study is completed to demonstrate no adverse impacts to the wastewater system.
- Floating material should not be present.
- In accordance with NOMs, hazardous materials or wastes are not discharged into the system.
- Municipalities can establish local discharge conditions for discharges into their sewer collection system to:
  - Provide more stringent limits to the contaminants presented in Table 6.2-7.
  - Add maximum permissible limits for contaminants not included in this NOM.

The conditions and requirements for a local pretreatment program and the discharge conditions must be supported by studies completed by the municipality or the affected parties.

6.2.3.3 Reporting, Recordkeeping, and Best Management Practices

Best management practices (BMPs) include facility-wide water use inventories to identify, quantify, and characterize wastewater sources, which include facility influent and stormwater. Complaints about water quality near the facility will be investigated by the facility and any deficiencies will be corrected. Records of all correspondence with regulatory agencies, sampling records and results, wastewater discharge reports, permits, and proof of fee payments should be maintained at the facility.

6.2.4 Biological Resources

Mexico has no single law that regulates biological diversity or wildlife. Regulations for the protection and management of wildlife are instead established in legislation: the LGEEPA; the Federal Fisheries Law (Ley Federal de Pesca), and the Regulation to the Federal Fisheries Law (Reglamento de la Ley Federal de Pesca) (CEC, 1997). LGEEPA Articles 79 to 83 regulate, in general terms, wild flora and fauna. Any development of floral and faunal natural resources, areas, or habitats, especially when endangered species are involved, must not alter the necessary conditions for the subsistence, development, and evolution of such species. Pursuant to the Ecology Law, these general criteria and measures must be followed in managing wild flora and fauna:

- Preservation of natural species habitat.
- Protection of the evolutionary processes of species and their genetic resources, including areas designated as representative for ecological systems for protection and research.
- Protection and development of endemic species, threatened or endangered by extinction, as a means to recuperate the stability of their population.
- Strengthening biological reproductive seasons and repopulating forest species.
- Promoting community awareness and participation in activities related to species conservation.

Threatened and endangered species are regulated under the general terms of the Ecology Law. NOM-059-ECOL-94 establishes lists of plants and fungi, mammals, birds, reptiles, amphibians, fish, and invertebrates classified as endangered, threatened with extinction, rare, or under special protection. Commercial development of the listed species habitats must ensure their conservation (CEC, 1997).

6.2.5 Land Use

The 1994 Summary Report for the Urban Development Program (Urban Planning and Ecology Department of the Tijuana Municipality) instituted the following designations that govern land uses near the SBIWTP and the former Hofer site.

6.2.5.1 Existing Urban Structure

The SBIWTP is north of a major residential zone and an equipping zone. The Tijuana Municipality is divided into 16 main zones, and each zone includes the following six categories: (1) residential, (2) commercial/services, (3) equipping, (4) industrial, (5) country estates, and (6) open spaces. The residential area to the south of the SBIWTP is included in Sector 3, which has a total land area of 5.8 acres (2.4 ha). To the southwest of the SBIWTP, along the border, Sector 1 includes the Playas de Tijuana residential area, and the area of the sector is approximately 1,304 acres (528 ha). To the southeast of the SBIWTP, approximately 60 percent of Sector 5 comprises a commercial/services area. The total sector area is 2,376 acres (962 ha).

6.2.5.2 Summary of Physical Conditions

Areas are classified according to the potential opportunities for development. The classification provides four different categories, including suitable, nonsuitable, conditional, and special use. The areas to the south of the SBIWTP mostly fall in the suitable category except for some areas that include canyons and ravines that slope toward the border.

6.2.5.3 Partial Planning Strategy

The partial planning strategy for the Tijuana Municipality divides Tijuana into 34 zones and sets categories for urban development. These categories are growth, improvement, and conservation. The zones to the south of the SBIWTP have four urban development categories.

Zone	Category
1	Growth and Improvement
2	Improvement
7	Improvement
11	Improvement

6.2.5.4 Proposed Land Use and Primary Zoning

The areas to the south of the SBIWTP are high-density residential areas targeted for growth and urban improvement.

Assuming that the sludge disposal facility could be located on federal lands, the right to use federal public property through a permit would be requested. To receive an assignment, permit or authorization for the use of federal public lands, an interested party must demonstrate the need for the activity or use, as well as the social and economic benefits that it will produce. Government agencies, within their areas of competency, may place a lien on the property or the authorization and require interested parties to pay a deposit equal to the amount of the lien in order to protect the public interest. A concession may be granted for up to 50 years and may be revoked if it fails to meet the ends or the conditions originally established or if the use or exploitation harms the land's ecosystems (CEC, 1997).

6.2.6 Traffic and Transportation

The institution with authority over all transportation matters is the Secretariat of Communications and Transport (Secretaria de Comunicaciones y Transportes, or SCT). The SCT is responsible for granting concessions, contracts and permits to private and public individuals intending to carry out transportation activities (e.g., the transport of hazardous waste). Pursuant to LGEEPA, all public and private activities must comply with all environmental laws and regulations. An environmental impact assessment (EIA), for example, *must* be completed in order to build any public road. All federal public transportation vehicles must also comply with emission verification and certification programs (CEC, 1997).

Regulations regarding the transport of hazardous materials and hazardous waste for import and export between Mexico and other nations specify approval and documentation requirements (Stuckey and Monasterio, 1997).

The import of hazardous materials and the export of hazardous waste must be authorized by SEMARNAP prior to transfer across the border. In addition, general customs regulations of the United States and Aduana (Mexican Customs) apply (Stuckey and Monasterio, 1997). If waste is imported or exported, a facility must submit to SEMARNAP a Guia Ecologia (Ecological Guidance Document, or Guia). The initial Guia must be filed 45 days before the first import/export, while subsequent Guias for subsequent shipments of the same waste must be filed 5 days before import/export.

6.2.6.1 Permits/Approvals

Guias must be requested by persons residing in Mexico and subject to its laws. The Guia provides information about the type of waste, the transporter, and the waste's origin and destination. An approved Guia is valid for 90 days, after which a new Guia must be approved. Authorization for each volume of waste is granted for a maximum period of 5 working days.

Exports of waste to the United States require completion of the Uniform Hazardous Waste Manifest and prior approval of the receiving state (note that Texas has additional waste importation requirements). Imports of hazardous materials from the United States must be accompanied by the appropriate material safety data sheet(s).

6.2.6.2 NOMs

The following NOMs apply for the transport of hazardous material and waste:

- Regulation for land transportation of hazardous materials and waste
- Listing of most commonly transported hazardous substances, materials and waste (NOM-002-SCT2-1994)
- Land transport of hazardous materials and waste (including container and labeling requirements) (NOM-003-SCT2-1994)
- Emergency information for land transportation of hazardous substances, materials, and waste (NOM-005-SCT2-1994)
- Basic aspects for daily visual inspections of the carrier unit for land transport of hazardous materials and waste (NOM-006-SCT2-1994)
- Containers and packaging for transport of hazardous substances and waste (NOM-007-SCT2-1994)
- Requirements for the inspection of the railroad tracking equipment for transport of hazardous materials and waste (NOM-OQ8-SCT2-1994)
- Compatibility and segregation provisions for storage and transport of hazardous substances, materials, and waste (NOM-010-SCT2-1994)
- Requirements for transport of limited quantities of hazardous substances, materials, and waste (NOM-011-SCT2-1994)
- Requirements for loading, handling, and unloading of hazardous materials and waste in railroad units (NGM-018-SCT2-1994)

- General provisions for cleanup and control of residues of hazardous substances and waste in carrier units for transport (NOM-019-SCT2-1994)
- General requirements for design and construction of railroad tank-vehicles intended for transport of hazardous material and waste, specification SCT 306, SCT 307, and SCT 312 (NOM-020-SCT2-1994)
- Technical specification for the placards that must be displayed by railroad tank-vehicles, metal intermediate bulk containers, and vessels with a capacity greater than 450 liters that transport hazardous materials and waste (NOM-023-SCT2-1994)
- Specifications for construction and reconstruction, as well as test methods, for containers and packaging of hazardous substances, materials, and waste (NOM-024-SCT2-1994)
- Specifications for construction and reconstruction of intermediate bulk-containers (NOM-029-SCT2-1994)

6.2.6.3 Reporting, Recordkeeping, and Best Management Practices

Notification of SEMARNAP is required within 15 calendar days after a transfer of hazardous waste across the border has occurred.

Transportation of hazardous materials over public roads is regulated by the SCT in Mexico. Waste shipments must be accompanied by a Hazardous Waste Manifest (Manifiesto de Entrega Transports y Recepcion de Residues Pelegrosos) and may only be conducted by transporters licensed by the Secretary of Communications and Transportation. Hazardous waste transport requires the proper labeling of containers and placarding of vehicles in Spanish. Hazardous waste containers must be labeled to:

- Identify contents as “Hazardous Waste.”
- Provide the generator/importer address and identification number.
- Indicate the EPA/SEMARNAP waste stream code (and the appropriate state waste code) and date.
- Indicate the manifest number.

The waste transporter must be properly registered and bonded. Shipping papers include United States and Mexican manifests and the Guia.

6.2.7 Public Health and Safety

6.2.7.1 Hazardous Waste Regulations

The regulations concerning hazardous waste would apply to the sludge disposal facility in Mexico if it disposes wastes determined to be hazardous.

Permits/Registrations

SEMARNAP authorizes the installation and operation of all hazardous waste collection, storage, treatment, and disposal facilities constructed in Mexico, Any facility handling hazardous waste must obtain an operating license (licensia de funcionamiento) or one-stop environmental license prior to commencing operations. In addition, a hazardous waste notification must be submitted to SEMARNAP before hazardous waste management facilities commence operation.

NOMs

Wastes are determined to be hazardous if they are corrosive, reactive, explosive, toxic, ignitable, or biologically infectious (CRETIB). CRETIB and hazardous waste are defined in NOM-052-ECOL-1993. A list of hazardous wastes includes the following listing under "Classification of Wastes by Non-Specific Source":

> Waste sludge from the biological treatment of wastewater containing any substance toxic to the environment in concentrations equal to or higher than the limits set in article 5.4 (CRETIB Code: T; INE Number: RPNE 1.1/0.2)

A mixture of hazardous waste (per NOM-052-ECOL4993) and nonhazardous waste is considered a hazardous waste.

NOMs for hazardous waste include:

- Criteria for hazardous waste characterization and listing (NOM-052-ECOL-1993)
- Procedure for performing the extraction test for determining the constituents that make a waste hazardous due to their toxicity to the environment (NOM-053-ECOL-1993)
- Requirements for facilities that store hazardous waste, excluding radioactive waste (NOM-055-ECOL-1993)
- Requirements for the design and construction of additional facilities at sites used for containment of hazardous waste (NOM-056-ECOL-1993)
- Requirements for design, construction, and operation of controlled storage cells for hazardous wastes determined in NOM-052-ECOL-1993 (NOM-057-ECOL-1993)
- Requirements for operation of sites used for containment of hazardous wastes (NOM-058-ECOL-1993)
- Regulations for land transport of hazardous materials and waste

NOMs for sludge include NOM-CRP-001-ECOL-1993 that establishes the characteristics of dangerous residuals, presents the listing of the same and the limits that make a residual hazardous due to its toxicity to the environment.

Reporting, Recordkeeping, and Best Management Practices

Special requirements for storage, labeling, recordkeeping, and shipping of hazardous waste apply. Open storage facilities should:

- Not be located in areas below the water level produced by the greatest storm registered in the zone, plus a safety factor of 1.5.
- Have smooth floors built of an impermeable material compatible with and resistant to the waste.
- Have lightning rods.

- Have gas and vapor detectors with an audible alarm where volatile wastes are stored.

Hazardous waste facilities must comply with the following reporting requirements to SEMARNAP:

- Semiannual shipment summary reports
- Annual reports of hazardous waste generation prepared on the *Encuesta Industrial* (this form may also serve as notification of anticipated changes in volumes or types of waste generated)
- Nonreceipt of the hazardous waste manifest from the disposal facility within 30 days of shipment
- Spills, leaks, discharges, or losses of hazardous waste

SEMARNAP requires the responsible facility to remediate soils contaminated with hazardous waste as a result of generation, handling, or final disposal of hazardous waste or materials (LGEEPA, Article 152, December 13, 1996). The cleanup goals are based on the activities proposed in the Urban Development or Ecological Arrangement Program applicable to the site or zone.

All facilities are encouraged to develop and implement BMPs for waste identification and tracking of inventory, waste minimization, storage and handling, treatment and disposal, emergency planning, training, reporting, and recordkeeping.

6.2.7.2 Solid Waste

Rules regarding the management of solid waste would apply to the sludge disposal facility in Mexico because it would store solid waste.

Permits/Registrations

The Mexican States have authority to regulate and manage all waste that is not corrosive, toxic, reactive, explosive, or biologically infectious. Landfills need to obtain the necessary approvals from state and local agencies to operate. Incineration, rather than disposal in a landfill, is encouraged for nonhazardous combustible wastes. Waste that does not strictly fit the criteria for hazardous waste (i.e., hazardous properties are not clearly exhibited), should be managed as hazardous waste.

NOMs

The following NOMs have been implemented or were being considered at the time the information sources were compiled (October 1995):

- Conditions that must be met at sites used as municipal landfills for solid waste (NOM-083-ECOL-1996)
- Draft requirements for the design and construction of sanitary landfills relating to topography, determination of solid wastes to be deposited, volumetric capacity, life span, storage cells, impermeable linings, drainage, leachate monitoring and extraction, access areas, and auxiliary facilities (Draft NOM-084-ECOL-1993)
- Draft site conditions for solid waste landfills providing binding standards related to topographical, geological, geohydrological, permeability, and aeration capacity of sites designated for solid waste landfills (Draft NOM-083-ECOL-1994)

Reporting, Recordkeeping, and Best Management Practices

Facilities should keep documentation indicating the nonhazardous status of wastes that have been tested and listing the quantities accepted.

6.2.8 Visual Resources

The summary report for the urban development program for the Tijuana Municipality (Programa de Desarrollo Urbano del Centro de Poblacion Tijuana—Version Abreviada, Urban Planning and Ecology Department of the Tijuana Municipality, 1994) includes in Section 2.4.4 imagen urbana (urban image) regulations and local criteria to preserve, improve, and in some cases develop a particular urban image by means of restrictions in the construction of urban facilities and greenbelts in public roads, public areas, open areas, and any other zones with potential for development.

This document states the importance of preservation of tree zones and the locations of public areas such as parks and recreation and sports facilities.

The forestation of streets and roads is very important to provide shading and to promote planting of trees to restrict access to the public in those zones requiring such restriction. Industrial zones must be protected with rows of trees to block the wind into the adjacent residential areas. Regulations control maximum allowed building heights and the setting of a building within a lot.

6.2.9 Air Quality Regulations

Air quality regulations could apply to the facility because emissions generated in the United States have the potential to affect air quality in Mexico. A sludge facility could also affect air quality, although a site has not been selected for sludge disposal. The following requirements apply to fixed (stationary) sources of air emissions located in Mexico.

To ensure that air quality standards are met, the One-Step Environmental License or Operating License acts as an air permit and may include the following:

- Requirement to submit air emissions inventories
- Specification of the frequency of submittal of the inventories
- Specification of the frequency of air pollution monitoring (e.g., annually for stacks of combustion sources such as boilers and dryers)
- List of steps to be taken in emergencies
- Specifications of air pollution control equipment and operating conditions

Table 6.2-8. Ambient Air Quality Standards for Mexico

Pollutant	Units	Average
O_3	0.11 ppm	1 hour
$S0_2$	0.13 ppm 0.03 ppm	24 hours annual
NO_2	0.21 ppm	1 hour
CO	11 ppm	8 hours
TSP	260 µg/m^3 75 µg/m^3	24 hours annual
PM_{10}	150 µg /m^3 50 µg /m^3	24 hours annual
Lead	1 .5 µg/m^3	3 months
Source: http://www.epa.gov/ttn/catc/cica/airq_e.html		

All air emissions must conform with air NOMs. The permit may also specify maximum emission levels with SEMARNAP if an area becomes a critical zone, more efficient control technologies become available, or upon modification of the source. Complaints from the public regarding nuisances (e.g., odors) will be investigated by the facility, which will correct any deficiencies. Regional and local requirements could be applicable in addition to federal requirements.

6.2.9.1 Standards

Health-based ambient air quality standards have been set by Mexico for various regions of the country. Table 6.2-8 lists the air quality standards applicable to the border area.

6.2.9.2 NOMs

NOMs include:

- Measurement methods for carbon monoxide, total suspended particulates in air, ozone, nitrogen dioxide, sulfur dioxide, including the calibration procedures for measurement equipment (NOM-034-ECOL-1993 through NOM-038)
- Maximum permissible levels of atmospheric emissions of solid particles from fixed sources (NOM-043-ECOL-1993)
- Criteria for evaluation of the environmental air quality for total suspended particles (TSP). Permissible value for TSP in air as a protective measure for general populations (NOM-024-SSAM993)

6.2.9.3 Reporting, Recordkeeping, and Best Management Practices

Reporting requirements include agency notification in case of failure of control equipment, unexpected startups and shutdowns that could cause pollution, and unauthorized releases. Aside from the air emission inventory, the Environmental Performance Report must be submitted during the first four months of every year.

All equipment specifications, reports, emissions inventories, maintenance records, and air modeling results should be kept, at the facility. BMPs should be instituted to properly characterize and control air emissions resulting from normal operations.

6.2.10 Noise

Noise regulations would apply to any future sludge disposal facility in Mexico if it operates stationary or mobile equipment.

6.2.10.1 Permits/Registrations

If a facility can demonstrate that it is technically or economically not feasible for that, facility to comply with applicable noise standards (see Table 6.2-9) it can request the determination of facility-specific noise standards. The application must include information on the location of the facility, the type of facility, origin and characterization of noise, reasons why the noise level cannot be reduced, and a time schedule for the operation of the noise source. Furthermore, the application must include a proposed program for maximum noise reduction and an implementation schedule for the program.

Exemptions do not exist for vehicles. Noncompliant vehicles should be either repaired or taken out of operation.

6.2.10.2 Standards

Noise monitoring is not required but facilities must comply with noise standards. The maximum permissible noise level from a stationary source, as measured at the property boundary, is 68 dBA from 6 AM to 10 PM and 65 dBA for the remaining hours. The degree of annoyance shall not exceed 5 degrees on a modified Likert 7 degree scale. Warning devices are exempted from this standard. Table 6.2-9 lists compliance standards for trucks and heavy equipment.

Table 6.2-9. Equipment Noise Standards

Gross Vehicle Weight	Up to 3,000 kg	Up to 10,000 kg	Over 10,000 kg
Maximum Permissible Level (dBA)	79	81	84
The measurements shall be taken 15 meters (50 feet) from the source by the Dynamic Method according to the respective standard. Source: Stuckey and Monasterio, 1997.			

Measurements demonstrating compliance must be taken continuously or semi-continuously during a 15-minute interval.

6.2.10.3 NOMs

NOM-081-ECOL-1994 establishes the maximum permissible limits for noise emissions from a fixed source and monitoring procedures. In this norm, Section 6.4 sets the maximum permissible limits for weighted noise levels and are presented in Table 6.2-10.

Table 6.2-10. Maximum Permissible Limits for Weighted Noise Levels

Hour of the Day	Maximum Permissible Limits
From 06:00 to 22:00	68 dB
From 22:00 to 06:00	65 dB
dB = decibel	

The environmental protection and ecological protection law and regulations for the State of Baja California, Mexico also provides definitions and limitations for noise under Chapter II, Control and Prevention of Pollution by Noise, Vibrations, Thermal

Energy, Light, and Unpleasant Odors. Section I, Definitions Under Article 153, provides definitions.

6.2.10.4 Reporting, Recordkeeping, and Best Management Practices

Noise measurements should be taken and records should be kept to demonstrate compliance. Vehicles should be appropriately maintained to minimize noise impacts. A system should be implemented to respond to and investigate noise complaints.

6.2.11 Energy Consumption

According to the national Energy Conservation Program (Programs de Conservation de Energia) issued by the Energy Secretariat (Secretaria de Energia), the consumption of electric energy should be reduced in order to provide it at a very low cost to the consumer (CEC, 1997). The public and private use of productive resources should be conducted in the public interest and in accordance with principles of social equity in order to conserve such resources and protect the environment.

6.2.12 Social Participation and Distribution of Environmental Information

6.2.12.1 Public Access

While Mexico does not have a general law requiring public access to information, LGEEPA provides for general public access to MIAs. The Federal Attorney General for Environmental Protection (Procuraduria Federal de Protection al Ambiente, or PROFEPA), a decentralized entity within SEMARNAP, is responsible for general promotion and dissemination of environmental information. Although not specifically provided for in the law, the National Institute of Ecology (Instituto National de Ecologia, or INE) is also a major source of environmental information through the publication of special documents and reports, including the biannual "Report of the General Situation in Ecological Balance and Environmental Information" (Informe de la Situation General Sobre el Equilibrio Ecologico y Information Ambiental),

The Ecological Gazette is issued every 3 months by INE, which is also a decentralized entity within SEMARNAP. The law directs INE to include in the Ecological Gazette all new NOMs, agreements, orders, resolutions, circulars, notices, and general communications corresponding to SEMARNAP. INE is also responsible for publishing notices informing the public of EIAs that are available for citizen review.

6.2.12.2 Social Participation

The federal government is required to promote social participation in the formulation of environmental policy, in the application of environmental laws, and in information and enforcement actions including MIAs.

CHAPTER 7 – CONSULTATION AND COORDINATION

This chapter describes the consultation process followed by the USIBWC for development of the Draft SEIS. Key issues discussed by stakeholders were previously listed in Subchapter 1.5. Also included is the distribution list for the Draft SEIS.

7.1 OVERVIEW OF THE DRAFT SEIS PREPARATION

The USIBWC issued a Notice of Intent for preparation of the Draft SEIS on October 22, 2003. The notice also invited agencies and the public to a public scoping meeting for the project. Preliminary alternatives were identified in the Notice of Intent and presented for stakeholder review during the scoping meeting. The consultation process followed by the USIBWC for preparation of the Draft SEIS is described below.

7.1.1 Public Involvement Process

Throughout the SEIS development process, the USIBWC has emphasized public involvement through various community meetings:

- A public scoping meeting was held on November 12, 2003 at the San Ysidro Middle School in San Diego, California.
- Quarterly meetings of the USIBWC Citizens' Forum were held in the San Diego area to promote the exchange of information related to ongoing and future USIBWC projects:
  - A public meeting was held on March 2, 2004, at the Southwest High School Cafeteria, 1685 Hollister Street, San Ysidro. During this meeting, wastewater researcher Gerhard Van Drie, R.C.E., discussed the High Purity Oxygen Activated Sludge System, an innovative and low-odor process for providing secondary treatment of wastewater. As a variant of the activated sludge alternative, this alternative was considered by the USIBWC. Due to operational constraints, this alternative was rejected from further consideration by the USIBWC (refer to Table 2.3-1 of Subchapter 2.3).
  - A public meeting was held on June 8, 2004, in the San Ysidro High School Cafeteria. This meeting was held to announce new board members of the Citizen's Forum.
  - A public meeting was held on September 16, 2004, at the Imperial Beach Community Room. The meeting was held to discuss the Tijuana River Watershed Binational Vision Project, efforts to provide secondary treatment of wastewater at the SBIWTP, and the proposed Smuggler's Gulch Sediment/Debris Basin.

7.1.2 Public Scoping Meeting

Advance notification of the public scoping meeting was published in two local newspapers: San Diego Union-Tribune on October 31, November 1, and November 2, 2003; and, Daily Transcript on October 31, 2003. Individuals, who read the notice in the paper announcing the meeting, and did not attend the meeting, were given an address to which they could submit written comments.

The notice of the public scoping meeting was mailed to 652 elected officials, federal/state/local agencies, organizations and individuals. The mailing list was developed from a mailing list provided by the USIBWC (San Ysidro Office) and updated with current addresses. The mailing list consisted of the following: 21 elected officials, 19 federal agencies, 25 state agencies, 25 county agencies, 50 city agencies (San Diego, Chula Vista, Imperial Beach, National City, Coronado and Poway), 2 Port of San Diego, 11 water districts or companies, 78 private interest groups, 393 interested individuals, 11 libraries, and 17 media. Of the 652 letters mailed out, a total of 44 letters were returned as undeliverable (the mailing list has since been updated).

The public scoping meeting held on November 12, 2003 consisted of an informational presentation by the USIBWC that described the treatment options and explained the environmental review process. Each person was given the opportunity to make a statement during the second portion of the meeting. Additionally, each person had the opportunity to submit a written statement concerning the proposal. Table 7.1-1 is a summary of the format, source and number of comments received during the public scoping process.

Table 7.1-1. Summary of Comments Received During the Public Scoping Process

Source	No.
1. Format of Comments Received	
Oral Testimony	10
Written Comment Sheets Received	1
Written Comment Letters Received	9
Email Comments Received	1
Total Written Comments Received	10
2. Public Scoping Meeting	
Persons in Attendance	35
No. of Persons Who Made Oral Testimony	10
Written Comment Sheets Received	1
3. Source of Comments	**No. of Comments**
Federal Agencies (U.S. Fish and Wildlife Service [USFWS])	24
State Agencies (State Water Resources Control Board and California Coastal Commission)	2
Local Agencies (City of San Diego Utilities General Manager)	0
Water Districts(Tia Juana Valley County Water District)	1
Interested Organizations (Citizens Revolting Against Pollution, Sierra Club, Southwest Center for Environmental Research & Policy [SCERP])	16
Individuals	1
Total Environmental Comments Received	**44**

In addition to the letter from the City of San Diego received during the public scooping period, the United States EPA received a letter from the City of San Diego dated October 11, 2004, concerning capacity of the Metropolitan Sewerage System.

A letter to the USIBWC dated January 9, 2003, from the Mayor of San Diego concerning use of the SBWRP or PLWTP was also received.

The environmental subjects that received the most comments were: water resources; public health and safety; biological resources; and, oceanography. The number of comments received for each of the SEIS resource areas, and specific environmental issue areas raised, are shown in Table 7.1-2.

Table 7.1-2. Summary of Environmental Comments by Subject

Description	No. of Comments
a. Subject of Comments	
Air Quality and Odors	3
Biological Resources	9
Cultural and Paleontological Resources	0
Ecological Risks and Transboundary Effects	3
Energy Conservation	1
Environmental Justice	0
Geologic Resources	0
Land Use	1
Noise	0
Oceanography	5
Public Health and Safety	9
Water Resources (Hydrology and Water Quality)	13
Total No. of Environmental Comments	**44**
b. Specific Issue Areas Raised	
Acute and Chronic Toxicity	
Contaminant Concentration and Impacts	
Existing Water Quality	
Water Use	
Ecological Risks	
Threatened and Endangered Species	

The Draft SEIS addresses the specific issues and concerns raised during the scoping process as shown on Table 7.1-3.

Table 7.1-3. Specific Issues Identified During the Scoping Process

SEIS Environmental Resource Area	Issue
Water Resources (Hydrology and Water Quality)	• Water use in reclamation and treatment processes/design
	• Water and wastewater research
	• Evaluate each alternative for effectiveness to comply with the Clean Water Act, California Porter-Cologne Water Quality Control Act, and the 2001 California Ocean Plan
	• Unexpected changes in groundwater levels and soil moisture conditions in the Tijuana River Valley from capture of dry and wet weather sewage flows
	• Ability of facility to capture wastewater during wet weather conditions
	• Results of long-term monitoring of wastewater quality in Mexico, identify contaminants and concentration levels
	• Identify pretreatment programs being implemented
	• Results of long-term monitoring for SBIWTP ocean outfall and identification of contaminants and concentrations being discharged
	• Changes in watershed hydrology, ability of facility to handle and treat increased flows due to increased development
	• Effluent disposal affect the Tijuana River National Estuarine Reserve and recreational beaches of San Diego and Tijuana
	• Water supply (transboundary)
	• Surface, ground and discharge water quality (transboundary)
	• Develop useful indicators of water quality
Oceanography	• Ocean impacts of primary treated sewage
	• Volume of, and contaminant concentrations found in, untreated Mexican wastewater discharged into the Pacific Ocean
	• Volume of wastewater that would remain in Mexico untreated and discharged into the Pacific Ocean
	• Volume of wastewater that would be treated in the United States and pumped back to Mexico to be discharged into the Pacific Ocean at SABWWTP, at Punta Bandera and other locations
	• Effects of up or down coast longshore currents and gyres in the spread and distribution of contaminants being discharged in the United States or Mexico
Biological Resources	• Footprint of impacts of piping and pumping
	• Avoid or minimize effects to federally listed threatened and endangered species
	• Minimize exposure of fish and wildlife to contaminants
	• Effects of construction and operational noise on listed species
	• Quantification of impacts to sensitive habitats including coastal sage scrub, maritime succulent scrub, southern maritime chaparral, grasslands, willow and mulefat scrub, cattails, vernal pools, open water, and waters of the United States.
	• Mitigation ratios and locations where project-related impacts to sensitive habitats could be offset
	• Specific conservation measures that can be incorporated into the proposed action to avoid or minimize effects to federally listed species
	• Alternatives 3 and 4 would represent a backward step to protect marine resources

Table 7.1-3. Specific Issues Identified During the Scoping Process (Cont'd)

SEIS Environmental Resource Area	Issue
Air Quality and Odors	• Smells • SBIWTP sending odors to Coral Gate • Air quality impacts (transboundary)
Land Use	Coastal zone consistency
Public Health and Safety	• Vulnerability and toxic upsets • Acute toxicity frequency and duration, effectiveness to reduce acute toxicity • Stability of system and risk of upsets (dioxin, heavy metals, pesticides, industrial wastes, polynuclear aromatic hydrocarbons (PAH) and others) • Quantity, concentration level of contaminants, and disposal locations for sludge generated by this treatment • Amount of chlorination to be used as disinfectant • Alternatives 3 and 4 would pose unacceptable human health risks • SBIWTP exceeds permitted acute and chronic toxicity limits. Identity and source, and impacts on wastewater treatability unresolved. • Develop useful indicators of human health risks • Human health risks from impacts to both sides (transboundary)
Ecological Risk and Transboundary Effects	• Transboundary Effects and binational research • Effects of contaminants in the discharge on fish and wildlife resources, including a risk assessment for fish and wildlife resources from contaminants in the discharge. • Transboundary Environmental Impact Statement
Energy Conservation	• Consider energy needs and costs

7.1.3 Comments on Project Alternatives

While project-related comments concerning current operations and conditions at the SBIWTP were received, many comments were directed at the range of alternatives being considered by the USIBWC. Table 7.1-4 summarizes the comments concerning the alternative treatment options that were considered.

Environmental resource areas and specific issues of concern for the SEIS were identified during the public scoping meeting and responses received on the published Notice of Intent to prepare a Draft SEIS. The input received during the public scoping process has influenced the identification and evaluation of alternatives considered in the Draft SEIS.

Table 7.1-4. Scoping Issues Raised for Project Alternatives

Alternative No.	Description of Alternative	Issues
1	No Action Alternative (Operation of the SBIWTP as Advanced Primary Facility)	• Would violate state and federal law because discharge would not meet secondary treatment standards • No funding to complete secondary treatment • Violates Clean Water Act, Cal State Ocean Plant, NPDES Permit and Minute 283 • Does not implement Tijuana River Act
2	Operate SBIWTP with Treated Flows Returned to Mexico for Discharge to Pacific Ocean at Punta Bandera	• No secondary treatment • Increases burden on Mexican system, effects on nearshore coastal water • Discharge would be shifted to Mexico. San Antonio de los Buenos plant cannot or will not accept the additional 25 mgd. • Would discharge untreated or partially treated sewage in Mexico. • Would abandon the South Bay Ocean Outfall • Previously studied and eliminated in 1998 • Would not comply with Minute 283
3	Operate SBIWTP With City of San Diego Connection	• Should combine Alternatives 5 (interim) and 7 to achieve secondary treatment • Point Loma plant would not provide for secondary treatment • Sending 10 mgd to Point Loma outfall not acceptable (City will need this capacity) • Rejected by City of San Diego by 11/20/02 vote to deny this request (due to toxicity, sludge handling, capacity, and potential to jeopardize sale of reclaimed water)
3	Operate SBIWTP With Treated Flows Sent to Mexico and the South Bay Water Reclamation Plant	• Rejected by City of San Diego by 11/20/02 vote to deny this request (due to toxicity, sludge handling, capacity, and potential to jeopardize sale of reclaimed water) • Discharge would be shifted to Mexico, and possibly discharged to surf (human health risk).
4	Public Law 106–457, Secondary Treatment Facility in Mexico	• Conflicts between Public Law 106-457 and Mexican laws unknown • Regulatory responsibility and authority unknown • Abandonment of SBOO is not reasonable of environmentally sound (no outfall in Tijuana) • Complies with Tijuana River Act • Implements Tijuana Master Plan and its selection of the regional WWTP in Rio Alamar Valley as preferred alternative (demonstrates Mexico's support) • USIBWC intended to modify Minute 283 to implement the Tijuana River Act.
5A	Completely Mixed Aeration Ponds at SBIWTP	• Should combine Alternatives 5 (interim) and 7 to achieve secondary treatment • Should consider biologically aerated filter (BAF) technology for the ponds • Opposed by City of San Diego because of potential impacts on local community • Inconsistent with the Tijuana River Act • Congress has not funded this alternative. • Nearby Coral Gate community may reject due to odors

Table 7.1-4. Scoping Issues Raised for Project Alternatives (Cont'd)

Alternative No.	Description of Alternative	Issues
7	SBIWTP Closure/Shutdown	• Possible negative effects on the South Bay beaches; USIBWC should complete project by implementing secondary treatment. • Would shut down over $300 million of United States taxpayer funded facilities • Would overload an overburdened wastewater treatment and conveyance system in Mexico. • Would violate Minute 283, Tijuana River Act and water quality laws
(NA)[a]	Operate SBIWTP With Treated Flows Returned to Mexico for Discharge to Pacific Ocean South of Punta Bandera	• No secondary treatment • Increases burden on Mexican system, effects on nearshore coastal water • Discharge would be shifted to Mexico, and possibly discharged to surf (human health risk) • Would discharge untreated or partially treated sewage in Mexico • Would abandon the SBOO • Previously studied and eliminated in 1998 • Would not comply with Minute 283.

[a]Not Applicable. This alternative has since been eliminated from further consideration (see Subchapter 2.3.1).

7.2 DISTRIBUTION LIST

The Draft SEIS is available on the USIBWC website at http://www.ibwc.state.gov. A printed copy of this Draft SEIS is being sent to the federal, state, and local agencies, libraries, and interested organizations listed in Table 7.2-1.

Table 7.2-1. Distribution List for the Draft EIS

Affiliation	City	State/Country
FEDERAL AGENCIES		
Environmental Protection Agency	Washington	DC
Environmental Protection Agency, Region IX	San Francisco	CA
United States Fish and Wildlife Service	Carlsbad	CA
IBWC, Mexican Section	San Diego	CA
Federal Emergency Management Agency, Region IX	Oakland	CA
STATE AND LOCAL AGENCIES		
Governor's Office of Planning and Research (State Clearinghouse)	Sacramento	CA
San Diego Regional Water Quality Control Board	San Diego	CA
Cal/EPA	Sacramento	CA
State Historic Preservation Office	Sacramento	CA
City of San Diego, Office of Binational Affairs	San Diego	CA
City of San Diego Metropolitan Wastewater Department, Public Works	San Diego	CA
UTILITIES AND WATER DISTRICTS		
Tia Juana Valley County Water District	San Diego	CA
ELECTED OFFICIALS		
U.S. Senator Diane Feinstein	San Diego	CA
U.S. Senator Barbara Boxer	San Diego	CA
Congressman Duncan Hunter (52nd District)	El Cajon	CA
Congressman Duke Cunningham (50th District)	Escondido	CA
Congressman Bob Filner (51st District)	Chula Vista	CA
State Senator Denise Moreno Ducheny (40th District)	Chula Vista	CA
Mayor, City of Imperial Beach (Diane Rose)	Imperial Beach	CA
Councilman Ralph Inzunza (District 8)	Imperial Beach	CA
Assemblymember Juan Vargas (79th District)	Chula Vista	CA
LIBRARIES		
Chula Vista, Imperial Beach , Coronado, National City, Mesa College, Otay Mesa Branch, Miramar College, San Diego Central, San Diego State University, San Ysidro, University of San Diego		CA
ORGANIZATIONS		
R.W. Beck	Seattle	WA
Bajagua Project, LLC	San Diego	CA
Boyle Engineering	San Diego	CA
Sullivan Consulting Group	San Diego	CA
Tijuana Slough Surf Club	Imperial Beach	CA
SCERP	San Diego	CA
Sierra Club	San Diego	CA
Audubon Society	San Diego	CA
Surfrider Foundation	Solana Beach	CA
Baykeeper	San Diego	CA
Citizens Revolting Against Pollution (David Gomez)	San Diego	CA
INDIVIDUALS		
George Gonzalez (Law Office)	San Diego	CA
Alan Langworthy	San Diego	CA
Gary Sirota	Encinitas	CA
Fred Threats	San Diego	CA
Gerhardt Van Drie	El Segundo	CA
Matt Bennett	Solana Beach	CA
Gilberto Bosques	Playa de Tijuana	Mexico
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Jim Simmons	La Jolla	CA

CHAPTER 8 – LIST OF PREPARERS

This chapter identifies reviewers and preparers of the Draft SEIS, indicating level of experience and contribution to the document preparation.

8.1 CONTRIBUTORS TO THE SEIS

Table 8.1-1 lists persons who participated in the agency review of the Draft SEIS and supporting documents.

Table 8.1-1. List of Draft SEIS Reviewers

Name	Degree	Title	Years of Experience	Contribution
United States Section, International Boundary Water Commission (Lead Federal Agency)				
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Dion McMicheaux	M.S., Civil Engineering	Project Manager	20	Document Reviewer
Steve Smullen	M.S., Environmental Engineering	Lead Engineer, Engineering Services Section	26	Engineering, Hydraulics and Hydrology and Document Reviewer
Daniel Borunda	M.S., Fisheries and Wildlife Science	Environmental Protection Specialist	8	Document Reviewer
Rong Kuo, P.E.	Ph.D., Civil Engineering	Civil Engineer	20	Engineering, Hydraulics and Hydrology and Document Reviewer
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United States Section, International Boundary Water Commission (USIBWC) Contractor				
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Elizabeth Borowiec	M.S., Environmental Planning	Project Manager	15	Document Reviewer
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Council on Environmental Quality				
Edward Boling	Juris Doctor	Deputy General Counsel	14	Legal Sufficiency and Document Reviewer

8.2 PREPARERS OF THE SEIS

Table 8.2-1 lists persons who prepared various sections of the Draft SEIS and supporting documents.

Table 8.2-1. List of Draft SEIS Preparers

Name	Degree	Title	Years of Experience	Contribution
PARSONS (NEPA Consultant)				
R. C. Wooten	Ph.D., Biology/Ecology	Vice President and Technical Manager	34	Program Director, Technical Direction and Quality Assurance
Rosemarie Crisologo	M.S., Environmental Engineering	Environmental Specialist	25	Project Manager
Christina Willis	B.A., Economics, Urban Planning	Environmental Planner	17	Deputy Project Manager; Land Use; Socioeconomics
Luciano Meiorin	Doctor in Electrical Engineering (M.S., Environmental Engineering)	Principal Environmental Engineer	30	Water Quality; Acute Toxicity
Carlos Victoria-Rueda	Ph.D., Environ-mental Engineering	Principal Environmental Engineer	19	Ecological Risk Assessment; Water Resources
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MBC (Oceanographic Consultant)				
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D. Shane Beck	B.A., Biology	Senior Scientist	12	Marine Biology

Table 8.2-1. List of Draft SEIS Preparers (Cont'd)

Name	Degree	Title	Years of Experience	Contribution
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Paul Fromer	M.S., Biology	Principal Biologist	24	Quality Assurance
Jennifer MacAller	B.S., Wildlife Conservation Biology	Associate Biologist	9	Terrestrial Biology (United States sites)
Russ Collett	B.A., Anthropology M.A., Archaeological Method and Theory (in progress)	Project Archaeologist	16	Cultural Resources (United States sites)

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CHAPTER 10 – GLOSSARY

100-year floodplain: The area along the river corridor that would receive flood waters during a 100-year flood event. This flood event has the probability of occurring 1 percent of the time during any given year. If a 100-year flood event occurs, the following year will still have the same probability for occurrence of a 100-year event. The 100-year floodplain also includes wetlands and meadows associated with the hydrologic and ecological processes of the river.

A

Acute Toxicity: The ability of a substance to cause severe biological harm or death soon after a single exposure or dose. Also, any poisonous effect resulting from a single short-term exposure to a toxic substance.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action. Describes current environmental conditions.

Alluvium: A general term for all deposits resulting from the operations of modern rivers, including the sediments laid down in riverbeds, floodplains, lakes, fans at the foot of mountain slopes, and estuaries.

Alternatives: Courses of action which may meet the objectives of a proposal at varying levels of accomplishment, including the most likely future conditions without the project or action.

Anatropous: (an organism) lacking the power of locomotion.

Aquifer: A geological formation or structure that stores and/or transmits water, such as to wells and springs.

Archaeology: Study of human cultures through the recovery and analysis of their material relics.

Arroyo: A gully or channel cut by an intermittent stream.

Artifact: A human-made object.

B

Backflooding: Flooding due to backup of excess flow behind a constriction in a major conduit.

Backwater: A small, generally shallow body of water attached to the main canal, with little or no current of its own.

Baseline: Condition that would prevail if no action were taken.

Bed material: Unconsolidated material of which a streambed is composed.

Benthic: Bottom of lakes or oceans; organisms that live on the bottom of water bodies.

Benthos: Organisms living in or on the bottom of a lake, pond, ocean, or stream.

Biological diversity: Number and kinds of organisms per unit area or volume; the composition of species in a given area at the given time.

Biological Opinion: Document which states the opinion of the U.S. Fish and Wildlife Service about whether a Federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.

Biota: The types of plant and animal life found in specific regions at specific times.

Bypass flow: Water allowed to flow past a diversion structure or storage facility.

C

Candidate species: Plant or animal species that are candidates for designation as endangered (becoming extinct) or threatened (likely to become endangered).

Capital costs: Costs (usually long-term debt) of financing construction and equipment. Capital costs are usually fixed, one-time expenses.

Channel: The bed or deepest portion of a stream, river, or other body of water.

Chronic toxicity: The capacity of a substance to cause long-term poisonous health effects in humans, animals, fish, and other organisms.

Community: A group of one or more interacting populations of plants and animals in a common spatial arrangement at a particular point in time.

Consumptive use: That part of water withdrawn that is evaporated, transpired by plants, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment. Also referred to as water consumed.

Contiguous: Touching or connected throughout in an unbroken sequence.

Conveyance loss: Water that is lost in transit from a canal, conduit, or ditch by leakage or evaporation. Generally, leakage from an irrigation ditch and percolate to a groundwater source and be available as groundwater.

Conservation easement: A restriction placed on a piece of property to protect the resources (natural or man-made) associated with the parcel.

Corridor: Narrow strip of land reserved that extends over several miles.

Critical habitat: Areas designated by the Secretary as critical habitat under section 4 of the ESA (16 USC sec. 1533). The term is a legal term which connotes a formal designation that takes place through a rulemaking process.

Cultural resource(s): Sites, structures, landscapes, and objects of some importance to a culture or community for scientific, traditional, religious, or other reasons.

Colonization: The successful establishment of a new habitat by a species.

D

Deposition: Material settling out of the water onto the streambed. Occurs when the energy of the flowing water is unable to support the load of suspended sediment.

Direct impact: An impact caused by an action that occurs at the same time and place as the [proposed] action (see 40 CFR 1508.8).

Discharge: The volume of water that passes a given location within a given period of time. Usually expressed in cubic feet per second.

Diversion: The transfer of water from a stream, lake, aquifer, or other source of water by a canal, pipe, well, or other method to another body of water or to the land, as in the case of an irrigation system.

Drainage basin: The area of land that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel. Also see watershed.

E

Easement: The right to use the real property of another for a specific purpose.

Ecosystem: Complex system composed of a community of animals and plants as well as the chemical and physical environment.

Emergent vegetation: Aquatic plants having most of the vegetation parts growing above water.

Embayment: The formation of a bay.

Emissions: Substances discharged into the air.

Endangered species: A species in danger of extinction throughout all or a significant portion of its range. As a general rule, the term is used only for species that have been formally listed as endangered under the Endangered Species Act (16 USC sec. 1531-1544).

Ephemeral: Streams that contain running water only for brief periods of time in direct response to precipitation.

Evaporation: Water vapor losses from water surfaces, sprinkler irrigation, and other related factors.

Evapotranspiration: The combined processes of evaporation and transpiration. It can be defined as the sum of water used by vegetation and water lost by evaporation.

Environmental consequences: A section in an Environmental Impact Statement that addresses the alternatives as they affect resource issues; it provides the scientific, analytical, and technical basis for assessing the impacts on those resources.

F

Facilities: Structures associated with irrigation projects, municipal and industrial water systems, power generation facilities, including all storage, conveyance, distribution, and drainage systems.

Fauna: Animals or animal life associated with a given habitat, country, area, or period.

Federal agency action: For purposes of the DEIS, actions authorized, funded or carried out by a federal agency and hence subject to Section 7 consultation requirements.

Flood or flooding: A general condition of partial or complete inundation of normally dry land areas from the overflow of inland and/or tidal water, or unusual and rapid accumulation of surface waters from any source.

Floodplain: A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Floodway: A shallow reservoir between the levee line and the bank of the river channel.

Flora: All plant life associated with a given habitat, country, or period. Bacteria are considered flora.

Flow: Volume of water passing a given point per unit of time.

Flume: An artificial channel or chute for a stream of water.

Freeboard: The designed height between the maximum water level and the crest of the flood control levees.

G, H

Gauge or gauging station: Specific location on a stream where systematic observations of hydrologic data are obtained through mechanical or electrical means.

Geomorphology: Geological study of the configuration and evolution of land forms and earth features.

Global Positioning System (GPS): A satellite navigation system used to determine terrestrial position, velocity, and time.

Gradient: General slope of rate of change in vertical elevation per unit of horizontal distance of water surface of a flowing stream.

Greenbelt: A belt of parkways, parks, or farmlands that encircles or runs through a community.

Groundwater: Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper level of the saturated zone is called the water table. Water stored underground in rock crevices and in the pores of geologic materials that make up the earth's crust. That part of the subsurface water which is in the zone of saturation; phreatic water.

Gyre: To move in a circle or spiral.

Habitat: Area or type of environment where a plant or animal lives.

Head: Differential of pressure causing flow in a fluid system, usually expressed in terms of the height of a liquid column (or the vertical distance in feet) that pressure will support.

Headwater: The source and upper part of a stream; water upstream of a dam or powerhouse.

Hydrograph: A graph of the rate of runoff plotted against time for a point on a channel.

Hydrology: Scientific study of water in nature-its properties, distribution, and behavior.

Hydraulic: Having to do with water in motion, as in the case of channel flow.

Hydraulic gradient: The slope of the hydraulic grade line. This is the slope of the water surface in an open channel, the slope of water surface of the groundwater table, or the slope of the water pressure for pipes under pressure.

I, J, K

Ichthyofauna: The fish life of a region.

Impoundment: Body of water created by a dam.

Indirect impacts: A condition caused by an action through intermediary causal agents. An effect for which the causal linkages to the action are not readily apparent.

infaunal: belonging to the benthic fauna living on the substrate and especially in a soft sea bottom.

Intermittent (stream): A stream that flows part of the time, usually after rainstorm, during wet weather, or for only part of the year. Also referred to as an ephemeral stream.

Invasive species: Species that evolved elsewhere and have been purposely or accidentally relocated.

Irretrievable: Commitments that are lost for a period of time.

Irreversible: Commitments that cannot be reversed, except perhaps in the extreme long term.

Irrigation releases: Releases of water from the Rio Grande for the purposes of irrigation in accordance with pre-approved agreements, contracts, leases, or charters between the landowner and the USBR.

L

Lease: A continuance or opportunity for continuance.

Levee: A natural or manmade earthen barrier along the edge of a stream, lake, or river.

Life cycle: Various stages through which an animal passes through from egg fertilization to death.

M

Main channel: The deepest or central part of the bed of a stream, containing the main current.

Maintenance: All routine and extraordinary work necessary to keep the facilities in good repair and reliable working order to fulfill the intended designed project purposes.

"May affect, not likely to adversely affect:" Means that all effects are beneficial, insignificant, or discountable.

Meander: A looplike, winding turn occurring in a river or stream that flows across nearly level terrain.

Mitigation: Action taken to avoid, reduce the severity of, or eliminate an adverse impact.

Modeling: Use of mathematical equations to simulate and predict real events and processes.

Monitoring: Measuring concentrations of substances in environmental media or in human or other biological tissues.

N

National Environmental Policy Act (NEPA): The federal law that requires Federal agencies to include in every recommendation or report on proposals for major Federal actions significantly affecting the quality of the human environment a detailed statement on the environmental impacts of the proposed action, any adverse environmental effects which cannot be avoided should the report be implemented, and alternatives to the proposed action (42 USC sec. 4321-4370e).

Native: Originating, grown, or produced in a particular region.

National Register of Historic Places: A federally maintained register of districts, sites, buildings, structures, architecture, archeology, and culture.

Neotropoical migrant landbirds: Nest in the United States or Canada and spend the winter primarily south in Mexico, Central or South America, or in the Caribbean.

No Action Alternative: The expected future condition if no action is taken. This future condition is not necessarily the same as the present condition. The effects of action alternatives are measured against this baseline condition.

No effect: Means there are absolutely no effects of the project, positive or negative.

O

Ophiuroid: Any of the various marine organisms of the Class Ophiuroidea, related to and resembling the starfish but having long slender arms.

Original Conveyance Channel: Open wastewater conveyance channel in Mexico (also known as the Rehabilitated Conveyance Channel).

P

Paleontology: A science dealing with the life of past geological periods as known from fossil remains.

Palustrine habitat: Marsh habitat.

Passerine: Of or pertaining to an order of small or medium-sized songbirds having grasping feet with the first toe directed backward.

Percolation: The movement of water through openings in rock or soil.

Phreatophyte: A deep-rooted plant that obtains its water from the water table or the layer of soil just above it. Commonly used to refer to plants, such as salt cedar or Russian Olive, which consume much water.

Playa: Beach

PM_{10}: (Air) particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

Public involvement: Process of obtaining citizen input into each stage of development of planning documents. Required as a major input into any EIS.

Pycnocline: Layers of water where the water density changes rapidly with depth (a layer separating water of different densities).

Q, R

Qualitative: Descriptive of kind, type, or direction, as opposed to size, magnitude, or degree.

Quantitative: Descriptive of size, magnitude, or degree.

Reach: Any specified length of a stream, river, channel, or other water conveyance.

Recharge: Water added to an aquifer. For instance, rainfall that seeps into the ground.

Recovery: Improvements in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act (50 CFR 402.02).

Recruitment: Survival of young plants and animals from birth to a life stage less vulnerable to environmental change.

Reference community: For this EIS, a desired future condition of vegetation communities that would be created as a result of implementing environmental measures.

Reservoir: Artificially impounded body of water; also, or an extra supply of anything.

Restoration: Repair or reconstruction of ecosystems damaged by human actions.

Return flow: The part of a diverted flow which is not consumptively used and which returns to a water body.

Riparian: Living on or adjacent to a water supply such as a riverbank, lake, or pond.

Riparian area: The land and vegetation along continuously or intermittently flowing rivers, streams and lake shores.

S

Scour: Removing debris and sediments from a channel by the force of water.

Sediment: Unconsolidated solid material that comes from weathering of rock and is carried by, suspended in, or deposited by water or wind.

Sediment load: Mass of sediment passing through a stream cross section in a given period of time, expressed in millions of tons.

Sensitive species: Species not yet officially listed but undergoing status review for listing on the U.S. Fish and Wildlife Service's official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

Shrubs: Plants with woody stems, generally less than 20 feet tall, such as willows.

Siphon: A piplike spillway for water conveyance.

Slope: Change in elevation per unit of horizontal distance

Species: Basic category of biological classification intended to designate a single kind of animal or plant.

Species of concern: Species for which further biological research and field study are needed to resolve their conservation status. Species of concern have no legal protection under the ESA but are often discussed for planning purposes.

Special status species: U.S. Fish and Wildlife Service or California Department of Fish and Game Species of Concern that may occur within the study area.

Stakeholder: An individual or group or individuals who own property and who will be affected by the decisions made.

Storage: Water held in a reservoir for later use.

Suspended solids: Solids that either float on the surface or are suspended in water or other liquids, and that are largely removable by laboratory filtering.

T

Thermocline: a layer in a thermally stratified body of water that separates an upper, warmer, lighter, oxygen-rich zone from a lower, colder, heavier oxygen-poor zone; a stratum in which temperature declines at least one degree centigrade with each meter increase in depth.

Threatened species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. As a general rule, the term is used only when a species has been formally listed as threatened under the ESA. (Note: States also have endangered species laws and may or may not use the same terms and definitions as the federal ESA).

Toxicity: The degree to which a substance or mixture of substances can harm humans or animals. Acute toxicity involves harmful effects in an organism through a single or short-term exposure. Chronic toxicity is the ability of a substance or mixture of substances to cause harmful effects over an extended period, usually upon repeated or continuous exposure sometimes lasting for the entire life of the exposed organism. Subchronic toxicity is the ability of the substance to cause effects for more than one year but less than the lifetime of the exposed organism.

Traditional cultural property: A site or resource that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community.

Transboundary effects: Environmental effects that extend across the border and affect another country's environment.

Transpiration: The process by which water that is absorbed by plants, usually through the roots, is evaporated into the atmosphere from the plant surface, such as leaf pores.

Transport capacity: The capacity of a river to carry sediment in suspension or to move sediment along the riverbed. Usually expressed as mass per unit of time.

Tributary: River or stream flowing into a larger river or stream**.**

Turbidity: The amount of solid particles that are suspended in water and that cause light rays shining through the water to scatter. Turbidity makes the water cloudy or even opaque in extreme cases.

U, V

Uplands: Ground elevated above the lowlands along rivers or between hills.

Velocity: Rate of flow of water or water-sediment mixture; expressed in feet per second or miles per hour.

W, X, Y, Z

Water consumption: The amount of water designated for consumptive use.

Watershed: The land that drains into a stream or a river.

Weir: A wall or obstruction used to control flow (from settling tanks and clarifiers) to ensure uniform flow rate and avoid short-circuiting.

Wetlands: Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds. Habitat provided by shallow or deep water (but less than 6-feet deep), with or without emergent and aquatic vegetation in wetlands.

CHAPTER 11 – INDEX

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APPENDIX A
NOTIFICATIONS AND PUBLIC SCOPING

I. Submission of Comments on This Notice and Internet Access to Comments and Submissions

You may submit comments in response to this document by (1) hard copy, (2) FAX transmission (facsimile), or (3) electronically through the OSHA webpage. Please note you cannot attach materials such as studies or journal articles to electronic comments. If you have additional materials, you must submit three copies of them to the OSHA Docket Office at the address above. The additional materials must clearly identify your electronic comments by name, date, subject and docket number so we can attach them to your comments. Because of security-related problems there may be a significant delay in the receipt of comments by regular mail. Please contact the OSHA Docket Office at (202) 693–2350 for information about security procedures concerning the delivery of materials by express delivery, hand delivery and messenger service.

II. Background

The Department of Labor, as part of its continuing effort to reduce paperwork and respondent (i.e. employer) burden, conducts a preclearance consultation program to provide the public with an opportunity to comment on proposed and continuing information-collection requirements in accordance with the Paperwork Reduction Act of 1995 (PRA–95) (44 U.S.C. 3506(c)(2)(A)).

This program ensures that information is in the desired format, reporting burden (time and cost) is minimal, collection instruments are clearly understood, and OSHA's estimate of the information-collection burden is correct. The Occupational Safety and Health Act of 1970 (the Act) authorizes information collection by employers as necessary or appropriate for enforcement of the Act or for developing information regarding the causes and prevention of occupational injuries, illnesses, and accidents (29 U.S.C. 657).

The certification requirement specified in the Aerial Lifts Standard demonstrates that the manufacturer or an equally-qualified entity has assessed a modified aerial lift and found that it was safe for use by, or near, employees; and would provide employees with a level of protection at least equivalent to the protection afforded by the lift prior to modification.

III. Special Issues for Comment

OSHA has a particular interest in comments on the following issues:

• Whether the proposed information-collection requirements are necessary for the proper performance of the Agency's functions to protect workers, including whether the information is useful;

• The accuracy of OSHA's estimate of the burden (time and costs) of the information-collection requirements, including the validity of the methodology and assumptions used;

• The quality, utility, and clarity of the information collected; and

• Ways to minimize the burden on employers who must comply; for example, by using automated or other technological information collection and transmission techniques.

IV. Proposed Actions

OSHA is proposing to extend the information-collection requirements in the Aerial Lift (29 CFR 1926.453(a)(2)). The Agency is requesting an increase of 12 hours, from 3 hours to 15 hours. The increase is a result of increasing the number of aerial lifts, which increased the number being inspected from 60 lifts to 300 lifts. The certification requirement specified in the Aerial Lifts Standard demonstrates that the manufacturer or an equally-qualified entity has assessed a modified aerial lift and found that it was safe for use by employees.

OSHA will summarize the comments submitted in response to this notice, and will include this summary in the request to OMB to extend the approval of the information collection requirements contained in the Aerial Lift Standard.

Type of Review: Extension of a currently-approved information-collection requirement.

Title: Manufacturer's Certification of Aerial Lifts in Construction (29 CFR 1926.453).

OMB Number: 1218–0216.

Affected Public: Business or other for-profit.

Number of Respondents: 300.

Frequency: On occasion.

Total Responses: 300.

Average Time Per Response: 3 minutes.

Estimated Total Burden Hours: 15 hours.

Estimated Cost (Operation and Maintenance): 0.

V. Authority and Signature

John L. Henshaw, Assistant Secretary of Labor for Occupational Safety and Health, directed the preparation of this notice. The authority for this notice is the Paperwork Reduction Act of 1995 (44 U.S.C. 3506), and Secretary of Labor's Order No. 5–2002 (67 FR 65008).

Signed at Washington, DC on October 16, 2003.

John L. Henshaw,

Assistant Secretary of Labor.

[FR Doc. 03–26611 Filed 10–21–03; 8:45 am]

BILLING CODE 4510–26–M

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, UNITED STATES SECTION

Notice of Intent To Prepare a Supplemental Environmental Impact Statement for Clean Water Act Compliance of the South Bay International Wastewater Treatment Plant, San Diego County, CA

AGENCY: United States Section, International Boundary and Water Commission.

ACTION: Notice of intent to prepare a draft Supplemental Environmental Impact Statement (SEIS).

SUMMARY: This notice advises the public that pursuant to Section 102(2) (c) of the National Environmental Policy Act of 1969, as amended, the United States Section, International Boundary and Water Commission (USIBWC) proposes to analyze and evaluate the impacts of alternatives for the South Bay International Wastewater Treatment Plant to achieve compliance with the Clean Water Act. The Draft SEIS will evaluate alternatives for treatment of sewage flows from Tijuana, Mexico that cross into the United States along the U.S/Mexican border in San Diego. This notice is being provided as required by the Council on Environmental Quality Regulations (40 CFR 1501.7) and the USIBWC's Operational Procedures for Implementing Section 102 of the National Environmental Policy Act of 1969, published in the **Federal Register** September 2, 1981 (46 FR 44083–44094) to obtain suggestions and information from other agencies and the public on the scope of issues to be addressed in the Draft SEIS. A public scoping meeting will be held to obtain community input to ensure that all concerns are identified and addressed in the Draft SEIS.

DATES: The USIBWC will conduct a public scoping meeting from 6 to 8 p.m. PST on Wednesday, November 12, 2003 at the San Ysidro Middle School, 4345 Otay Mesa Road, San Diego, CA. Full public participation by interested federal, State, and local agencies as well as other interested organizations and the general public is encouraged during the scoping process that will end 60 days from the date of this notice. Public comments on the scope of the Draft SEIS, reasonable alternatives that should be considered, anticipated environmental problems, and actions that might be taken to address them are requested.

FOR FURTHER INFORMATION CONTACT: Comments will be accepted for 60 days following the date of this notice by Mr. Charles Fischer, Environmental Protection Specialist, USIBWC, 2225 Dairy Mart Road, San Diego, California, 92173. Telephone: 619/662–7600, Facsimile: 619/662–7607. E-mail: *cfischer@ibwc.state.gov*

SUPPLEMENTARY INFORMATION: The USIBWC has invited the USEPA to participate as a cooperating agency pursuant to 40 CFR 1501.6, to the extent possible. Other agencies may be invited to become cooperators as they are identified during the scoping process.

Background

Since the 1930s, raw sewage flowing into the United States from Mexico has posed a serious threat to public health and the environment in the South Bay communities of San Diego. Although substantial improvements have been implemented over the last two decades, large volumes of untreated wastewater still flow into the Tijuana River Valley today during the rainy season.

In July 1990, the USIBWC and Mexico signed Treaty Minute 283, which outlined a plan for the treatment of renegade sewage flows emanating from Tijuana, Mexico and crossing into the United States along the U.S/Mexican border in San Diego. In the Minute, the two countries agreed to construct an international secondary wastewater treatment plant (IWTP) on the U.S. side of the border that would treat 25 million gallons per day (mgd) of dry-weather sewage flows.

In a 1994 Final Environmental Impact Statement (FEIS) and Record of Decision (ROD), the USIBWC and the EPA, acting as lead agencies, decided to approve the construction of the South Bay International Wastewater Treatment Plant (SBIWTP) and South Bay Ocean Outfall (SBOO). The SBIWTP is located on a 75-acre site just west of San Ysidro, CA near the intersection of Dairy Mart and Monument Roads. Treated effluent is discharged to the Pacific Ocean through the SBOO, a 4.5-mile long 11-foot diameter pipe completed in January 1999.

Pursuant to the completion of an interim operations supplemental environmental impact statement (SEIS), the EPA and the USIBWC decided to construct the SBIWTP in phases: by first building advanced primary facilities followed later by secondary treatment facilities. The intent of this phased construction was to expedite treatment of up to 25 mgd of untreated sewage from Tijuana, which would otherwise have continued to pollute the Tijuana River and Estuary, and coastal waters in the United States.

Treatment at the SBIWTP was initiated in April 1997 as an advanced primary plant with discharge initially through an emergency connection to the City of San Diego Point Loma treatment facility. In January 1999, the SBIWTP began discharging through the completed SBOO.

After the release of the May 1994 Final EIS and ROD and the decision to construct the SBIWTP in two stages, significant additional information became available and new circumstances occurred which warranted a reconsideration of the best means of achieving the completion of secondary treatment facilities at the SBIWTP. Also as a settlement to a lawsuit which challenged the 1994 FEIS, the USIBWC and EPA decided to prepare a SEIS that examined this new information, and the lawsuit was settled.

In January 1998, the USIBWC and the EPA issued the Draft Long Term Treatment Options SEIS (Draft SEIS), to re-evaluate secondary treatment options for the SBIWTP. In addition, in October 1998, the agencies also issued a supplement to the 1996 Interim Operation SEIS that addressed impacts of the advanced primary treatment. This supplement disclosed new information about the presence of dioxins and acute toxicity in the advanced primary discharge. This new information was incorporated into the Final Long Term Treatment Options Supplemental Environmental Impact Statement (Final SEIS) released in March 1999.

In the 1999 ROD for the Long Term Treatment Options SEIS, the EPA and the USIBWC selected the Completely Mixed Aerated (CMA) Pond System at the Hofer Site as the long-term option to provide secondary treatment of 25 mgd of wastewater at the SBIWTP. However, the construction of these secondary treatment facilities was not funded by Congress and the plant has continued to provide advanced primary treatment.

In February 2001, California's Office of the Attorney General, on behalf of the California Regional Water Quality Control Board, San Diego Region (Regional Board), filed a complaint in U.S. District Court, Southern District of California, alleging violations of the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act. Specifically, the complaint alleged USIBWC's discharge violated the terms of its National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Board for failing to treat the effluent to secondary standards and for violating other effluent limitations. The matter is now scheduled for trial.

The USIBWC has decided to prepare a Supplemental Environmental Impact Statement to address options/actions to cease violations of the NPDES permit limits either by providing secondary treatment in Mexico pursuant to Pub. L. 106–457; or by some other means, including but not limited to redirecting some or all of the IWTP effluent from California's waters and/or instituting some combination of these options.

Coordination with the U.S. Environmental Protection Agency, California Regional Water Control Board and other government agencies, as required, will take place to ensure compliance with applicable federal and state laws and regulations.

The environmental review of this project will be conducted in accordance with the requirements of NEPA, CEQ Regulations (40 CFR parts 1500–1508), other appropriate federal regulations and the USIBWC procedures for compliance with those regulations. Copies of the Draft SEIS will be transmitted to federal and state agencies and other interested parties for comments and will be filed with the Environmental Protection Agency in accordance with 40 CFR parts 1500 through 1508 and USIBWC procedures.

Alternatives

The Draft SEIS to be prepared will consider a range of alternatives, including the no action alternative, based on issues and concerns associated with the project. The Draft SEIS will identify, describe, and evaluate the existing environmental, cultural, sociological and economical, and recreational resources; and evaluate the impacts associated with the alternatives under consideration. Significant issues that have been identified to be addressed in the Draft SEIS include, but are not limited to, impacts to water resources, water quality, cultural and biological resources, and human health effects.

The Draft SEIS will evaluate eight alternatives, as described herein:

1. No Action

Operation of IWTP as an advanced primary facility would continue with discharge to the SBOO until secondary treatment facilities are constructed.

2. Pub. L. 106–457—Secondary Treatment Facility in Mexico

Operation of IWTP as an advanced primary facility would continue with 25 mgd of primary treated effluent sent to a Secondary Treatment Facility to be constructed in Mexico. Treated effluent would be discharged through the SBOO. Facilities in the U.S. would include: a pump station located on the SBIWTP site; a force main extending from the pump station across the international border to the site of the Secondary Treatment Facility in Mexico; and, a return flow pipeline from the treatment facility to connect with the SBOO.

3. Operate the IWTP with Treated Flows Returned to Mexico for Discharge to Pacific Ocean at Punta Bandera

Operation of IWTP as an advanced primary facility would continue with conveyance of the treated effluent to Mexico via primary effluent return connection (PERC) conveyance/pumping facilities at the SBIWTP and existing conveyance/pumping facilities in Tijuana. If effluent does not enter the San Antonio de los Buenos WWTP, it would be discharged to the surf at a point approximately 5 miles south of the U.S. border at Punta Bandera.

4. Operate the IWTP With Treated Flows Returned to Mexico for Discharge to Pacific Ocean South of Punta Bandera

ITWP would continue to be used for advanced primary treatment with discharge of treated effluent to the Pacific Ocean at a point approximately one mile south of Punta Bandera (approximately 6 miles south of U.S. border).

5. Operate IWTP With City of San Diego Connection

Operation of IWTP as an advanced primary facility would continue but with a total of 15 mgd of advanced primary treated effluent sent to the City of San Diego's Southbay Water Reclamation Plant (SBWRP) for secondary treatment via a new connection with discharge of treated effluent through SBOO. The IWTP would send 10 mgd of screened effluent to the City's Point Loma Wastewater Treatment Plant for secondary treatment via the City's South Metro Interceptor.

6. Operate the IWTP With Treated Flows To send to Mexico and SBWRP

This alternative would be the same as Alternative 5 but instead of sending 10 mgd of screened effluent to Point Loma WWTP, 10 mgd of primary treated effluent would be returned to Mexico for discharge to the Pacific Ocean at Punta Bandera.

7. Completely Mixed Aeration (CMA) Ponds (i.e., Secondary Treatment) at the IWTP

As evaluated in the 1999 FEIS and ROD, a CMA pond system would be constructed at the IWTP to provide secondary treatment.

8. IWTP Closure/Shutdown

The IWTP would be closed as a result of lawsuit resulting from SBIWTP's noncompliance with Clean Water Act. Mexico's current pumping, conveyance, and treatment facilities would be used to handle projected sewage flows.

Availability of the Draft SEIS

The USIBWC anticipates the Draft SEIS will be made available to the public by August 2004.

Dated: October 14, 2003.

Mario Lewis,

Legal Advisor.

[FR Doc. 03–26620 Filed 10–21–03; 8:45 am]

BILLING CODE 7010–01–P

FEDERAL MINE SAFETY AND HEALTH REVIEW COMMISSION

Sunshine Act, Meetings

October 15, 2003.

TIME AND DATE: 10 a.m., Thursday, October 23, 2003.

PLACE: Hearing Room, 9th Floor, 601 New Jersey Avenue, NW., Washington, DC

STATUS: Open.

MATTERS TO BE CONSIDERED: The Commission will consider and act upon the following in open session:

Secretary of Labor v. *Rag Shoshone Coal Corporation,* Docket No. WEST 99–342–R, WEST 99–384–R and WEST 2000–349. (Issues include whether the judge correctly concluded that the Secretary of Labor's interpretation of 30 CFR 70.207(e)(7) was reasonable; whether the judge correctly concluded that the Secretary of Labor was not required to engage in notice-and-comment rulemaking before imposing the 060 designed occupation for purposes of sampling levels of respirable cost dust; and whether the judge correctly concluded that the Secretary of Labor's imposition of the 060 designated occupation was not arbitrary, capricious, or an abuse of discretion.)

The Commission heard oral argument in this matter on October 9, 2003.

Any person attending this meeting who requires special accessibility features and/or auxiliary aids, such as sign language interpreters, must inform the Commission in advance of those needs. Subject to 29 CFR 2706.150(a)(3) and § 2706.160(d).

FOR FURTHER INFORMATION CONTACT: Jean Ellen (202) 434–9950/(202) 708–9300 for TDD Relay/1–800–877–9339 for toll free.

Jean H. Ellen,

Chief Docket Clerk.

[FR Doc. 03–26778 Filed 10–20–03; 1:19 pm]

BILLING CODE 6735–01–M

MORRIS K. UDALL SCHOLARSHIP AND EXCELLENCE IN NATIONAL ENVIRONMENTAL POLICY FOUNDATION

Notice of Federal Advisory Committee Meeting

AGENCY: U.S. Institute for Environmental Conflict Resolution, Morris K. Udall Foundation.

ACTION: Notice of meeting.

SUMMARY: The National Environmental Conflict Resolution (ECR) Advisory Committee, of the U.S. Institute for Environmental Conflict Resolution, will conduct a public meeting on Wednesday and Thursday, November 12–13, 2003, at the Westward Look Resort, 245 Ina Road, Tucson, Arizona 85704. The meeting will occur from 8 a.m. to approximately 5 p.m. on November 12, and from 8 a.m. to approximately noon on November 13.

Members of the public may attend the meeting in person. Seating is limited and is available on a first-come, first-served basis. During this meeting, the Committee will discuss: Committee organizational details; environmental conflict resolution (ECR) processes in connection with Section 101 of the National Environmental Policy Act (NEPA); best practices in ECR; reports of subcommittees on NEPA Section 101, best practices, and affected communities; and planning for future Committee work.

Members of the public may make oral comments at the meeting or submit written comments. In general, each individual or group making an oral presentation will be limited to five minutes, and total oral comment time will be limited to one-half hour each day. Written comments may be submitted by mail or by e-mail to *gargus@ecr.gov.* Written comments received in the Institute office far enough in advance of a meeting may be provided to the Committee prior to the meeting; comments received too near the meeting date to allow for distribution will normally be provided

Affidavit of Publication

PARSONS

100 W. WALNUT ST., #A2

PASADENA, CA 91123

ATTN: ROSEMARIE CRISOLOGO

STATE OF CALIFORNIA} ss.
County of San Diego}

The Undersigned, declares under penalty of perjury under the laws of the State of California: That....She is a resident of the County of San Diego.
THAT....She is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and that ....She is not a party to, nor interested in the above entitled matter; that ....She is.............................. Chief Clerk for the publisher of ....

The San Diego Union-Tribune

a newspaper of general circulation, printed and published daily in the City of San Diego, County of San Diego, and which newspaper is published for the dissemination of local news and intelligence of a general character, and which newspaper at all the times herein mentioned had and still has a bona fide subscription list of paying subscribers, and which newspaper has been established, printed and published at regular intervals in the said City of San Diego, County of San Diego, for a period exceeding one year next preceding the date of publication of the notice hereinafter referred to, and which newspaper is not devoted to nor published for the interests, entertainment or instruction of a particular class, profession, trade, calling, race, or denomination, or any number of same; that the notice of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following date, to-wit:

OCTOBER 31, NOVEMBER1 & 2, 2003

Chief Clerk for the Publisher

Affidavit of Publication of

Legal Classified Advertisement

Ad # 8645522

Ordered by: ROSEMARIE CRISOLOGO

NOTICE OF PUBLIC MEETING

The United States Section of the International Boundary and Water Commission (USIBWC) will hold a Public Scoping Meeting regarding alternatives for the South Bay International Wastewater Treatment Plant to achieve compliance with the Clean Water Act. The USIBWC will be preparing a Supplemental Environmental Impact Statement (SEIS) pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. The SEIS will evaluate the environmental impacts that could result from alternative methods for treating sewage flows from Tijuana, Mexico that cross into the United States along the U.S/Mexican border in San Diego.

A Public Scoping Meeting is being held to obtain input on the scope of issues to be addressed in the SEIS. This meeting will be held from 6 to 8 p.m. PST on Wednesday, November 12, 2003 at the San Ysidro Middle School, 4345 Otay Mesa Road, San Diego, CA. Full public participation by interested federal, State, and local agencies as well as other interested organizations and the general public is encouraged during the scoping process that will end on December 22, 2003. Comments on the scope of the SEIS, reasonable alternatives that should be considered, anticipated environmental problems, and actions that might be taken to address them are requested.

The SEIS to be prepared will consider a range of alternatives, including the no action alternative, based on issues and concerns associated with the project. The SEIS will identify, describe, and evaluate the existing environmental, cultural, sociological and economical, and recreational resources; and evaluate the impacts associated with the alternatives under consideration. Significant issues that have been identified to be addressed in the SEIS include, but are not limited to, impacts to water resources, water quality, and human health effects.

A Notice of Intent to prepare an SEIS for this project was published in the Federal Register (Vol. 68, No. 204) on Wednesday, October 22, 2003. This notice can be viewed at: http://www.access.gpo.gov/su_docs/fedreg/a031022c.html
The USIBWC anticipates the Draft SEIS will be made available to the public by August 2004.

Please send comments to Mr. Charles Fischer, Environmental Protection Specialist, USIBWC, 2225 Dairy Mart Road, San Diego, California, 92173. Telephone: 619/662-7600, Facsimile: 619/662-7607, E-mail: cfischer@ibwc.state.gov
Comments should be received no later than December 22, 2003.

CERTIFICATE OF PUBLICATION

RoseMarie Crisologo
Parsons
100 W. Walnut St.
Pasadena, CA 91123

IN THE MATTER OF

Scoping Meeting

NO. ____________

NOTICE OF PUBLIC MEETING

The United States Section of the International Boundary and Water Commission (USIBWC) will hold a Public Scoping Meeting regarding alternatives for the South Bay International Wastewater Treatment Plant to achieve compliance with the Clean Water Act. The USIBWC will be preparing a Supplemental Environmental Impact Statement (SEIS) pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. The SEIS will evaluate the environmental impacts that could result from alternative methods for treating sewage flows from Tijuana, Mexico that cross into the United States along the U.S/Mexican border in San Diego.

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The SEIS to be prepared will consider a range of alternatives, including the no action alternative, based on issues and concerns associated with the project. The SEIS will identify, describe, and evaluate the existing environmental, cultural, sociological and economical, and recreational resources; and evaluate the impacts associated with the alternatives under consideration. Significant issues that have been identified to be addressed in the SEIS include, but are not limited to, impacts to water resources, water quality, and human health effects.

A Notice of Intent to prepare an SEIS for this project was published in the Federal Register (Vol. 68, No. 204) on Wednesday, October 22, 2003. This notice can be viewed at [illegible]. The USIBWC anticipates the Draft SEIS will be made available to the public by August 2004.

Please send comments to Mr. Charles Fischer, Environmental Protection Specialist, USIBWC, 2225 Dairy Mart Road, San Diego, California 92173. Telephone: 619/662-7600, Facsimile: 619/662-7607, E-mail: cfischer@ibwc.state.gov. Comments should be received no later than December 22, 2003.

Pub. Oct. 31-k108800

I, Eboni Hines, am a citizen of the United States and a resident resident of the county aforesaid; I am over the age of eighteen years, and not party to or interested in the above entitled matter. I am the principal clerk of the Daily Transcript, a newspaper of general circulation, printed and published daily, except Saturdays and Sundays, in the City of San Diego, County of San Diego and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Diego, State of California, under the date of January 23, 1909, Decree No. 14894; and the

NOTICE OF PUBLIC MEETING

Is a true and correct copy of which the annexed is a printed copy and was published in said newspaper on the following date(s), to wit:

OCTOBER 31

I certify under penalty of perjury that the foregoing is true and correct.

Dated at San Diego, California this 31 day of October, 2003

Eboni N. Hines
(Signature)

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

OCT 2 9 2003

Dear Stakeholder:

The United States Section, International Boundary and Water Commission (USIBWC) is undertaking preparation of a Supplemental Environmental Impact Statement (SEIS) to analyze and evaluate the impacts of alternatives for the South Bay International Wastewater Treatment Plant to achieve compliance with the Clean Water Act. An updating of the project conditions and analysis of alternatives in the form of a SEIS is required to satisfy the requirements of the National Environmental Policy Act.

The USIBWC will conduct a public scoping meeting for the project from 6:00 - 8:00 p.m. on Wednesday, November 12, 2003 at the San Ysidro Middle School, 4345 Otay Mesa Road, San Diego, CA. The USIBWC will accept public comments on the scope of the SEIS, reasonable alternatives that should be considered, anticipated environmental problems, and related issues.

The SEIS will evaluate alternatives for treatment of sewage from Tijuana, Mexico that crosses into the United States along the international border in San Diego. Currently, the USIBWC treats that sewage to the advanced primary level at its South Bay International Wastewater Treatment Plant. The SEIS will discuss 8 alternatives, including alternatives providing for the discharge of the plant's effluent into Mexican, rather than U.S., waters; alternatives for secondary treatment by existing plants operated by the City of San Diego; secondary treatment at a facility to be constructed in Mexico in accordance with Public Law 106-457; secondary treatment at the existing plant; and shutdown of the existing plant, with all sewage flows handled in Mexico.

The USIBWC will continue to accept public comment on the scope of issues to be addressed in the SEIS through December 22, 2003. Comments can be sent to Mr. Charles Fischer, Environmental Protection Specialist, USIBWC, 2225 Dairy Mart Road, San Diego, CA 92173, telephone: 619-662-7600, fax: 619-662-7607, e-mail: cfischer@ibwc.state.gov.

The complete Notice of Intent to Prepare a Supplemental Environmental Impact Statement is available in the Federal Register, Vol. 68, No. 204, Wednesday, October 22, 2003, http://www.access.gpo.gov/su_docs/fedreg/a031022c.html.

Sincerely,

Douglas Echlin

Douglas Echlin
Acting Chief
Environmental Management Division

APPENDIX B
IBWC MINUTES

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

MINUTE NO. 270

Ciudad Juarez, Chih.
April 30, 1985

RECOMMENDATIONS FOR THE FIRST STAGE TREATMENT AND DISPOSAL FACILITIES FOR THE SOLUTION OF THE BORDER SANITATION PROBLEM AT SAN DIEGO, CALIFORNIA-TIJUANA, BAJA CALIFORNIA

The Commission met in the offices of the Mexican Section in Ciudad Juarez, Chihuahua, at 10:00 a.m. on April 30, 1985, to consider the border sanitation problem at San Diego, California-Tijuana, Baja California, to review the plans for the first stage treatment and disposal facilities prepared by the Secretariat of Urban Development and Ecology (SEDUE) of Mexico for solution of the problem, and to formulate recommendations to the two Governments with respect thereto.

The Commission referred to the last paragraph in Article 3 of the Water Treaty relating to the "Utilization of the Waters of the Colorado and Tijuana Rivers, and of the Rio Grande", signed February 3, 1944, which stipulates that the two Governments "agree to give preferential attention to the solution of all border sanitation problems". The Commission also referred to Recommendation No. 4 of Minute No. 261 dated September 24, 1979, which was approved by the two Governments and which stipulates, "that for each of the border sanitation problems, the Commission prepare a Minute for the approval of the two Governments, in which there would be included, identification of the problem, definition of conditions which require solution, specific quality standards that should be applied, the course of action that should be followed for its solution, and the specific time schedule for its implementation".

The Commission also referred to the Agreement signed by Presidents Reagan and de la Madrid on August 14, 1983 on "Cooperation for the Protection and Improvement of the Environment in the Border Area", Article 2 of which stipulates that, "the parties undertake, to the fullest extent practical, to adopt appropriate measures to prevent, reduce and eliminate sources of pollution in their respective territory which affect the border area of the other".

The Commissioners reviewed each of the border sanitation problems which need resolution and agreed that the problem in the San Diego-Tijuana area is the most urgent and requires solution as soon as possible.

The Commissioners noted that the problem in the San Diego-Tijuana area results from discharges of untreated sanitary wastewaters from the city of Tijuana northward along the natural drainage courses and in the Tijuana River, crossing the international boundary into the territory of the United States. They also noted that contributing to the problem are the northward littoral currents of the coastal waters which at certain times of the year result in Tijuana wastewaters discharged to the ocean south of the boundary, being carried northward onto the beaches of Tijuana and south San Diego. They noted that the existing facilities for disposal of Tijuana sanitary wastewaters were constructed in 1962 for discharge of the untreated wastewaters at a point about 5.6 miles (9.0 km) south of the boundary. They examined the record of operations of the facilities which shows frequent periods, often of long duration, in which the facilities were out of operation. The Commissioners observed that in the last 20 years, the population of Tijuana has increased from about 200,000 to about 800,000 inhabitants greatly increasing the volume of sanitary wastewaters to be disposed of. They observed that for these reasons, there have been frequent and extended periods of pollution of the coastal waters and the beaches on both sides of the boundary, and of the Tijuana River and adjoining lands, creating serious hazards to the health and well-being of inhabitants in the areas, and impairing the beneficial use of these waters.

The Commissioners reviewed the Integrated Project for Potable Water and Sewerage prepared by Mexico to improve the potable water supply and distribution system, and to expand the sanitary wastewater collection network needed to serve the growing population of the city of Tijuana, and noted its relation to the solution of the border sanitation problem. They also noted that as a part of the Integrated Project Mexico will soon complete an aqueduct to supply the city of Tijuana with water from the Colorado River in an amount up to 80 million gallons per day (mgd) (3500 liters per second, lps), which will triple the current supply, and will satisfy the city's needs to near the year 2000. The Commissioners observed that the engineers of the Secretariat of Urban Development and Ecology (SEDUE), estimate that the volume of sanitary wastewaters will increase from the current average discharge of approximately 18 mgd (800 lps), to 38 mgd (1660 lps) by 1989 and to 73 mgd (3200 lps) by the year 2000. They noted that the Integrated Project will be carried out in two stages.

The Commissioners made note that SEDUE of Mexico has undertaken to resolve the Tijuana border sanitation problem for which it has prepared a plan for the facilities to treat and dispose of the sanitary wastewaters, as a part of the first stage of the Integrated Project for Potable Water and Sewerage for Tijuana, hereinafter referred to as "first stage treatment and disposal facilities". A description of the plan for the first stage treatment and disposal facilities, including copies of a location plan, a general plan, a flow diagram, a construction schedule and a related table of estimated increases in discharges of sanitary wastewaters all prepared by SEDUE is attached, and forms a part of this Minute. The Commissioners noted that the Project provides for a pumping plant, maximum operating capacity 50 mgd (2200 lps) in the northwesterly part of the city, adjoining the international boundary, to pump the sanitary wastewaters of the city westward by means of a reinforced concrete pipeline, maximum capacity 62 mgd (2700 lps), a distance of 2.7 miles (4.3 km) to a point near the coast. At that point the wastewaters are to be conveyed south first by gravity in a closed conduit and then in an

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open canal, maximum capacity 62 mgd (2700 lps), to a point about 4 miles (6.4 km) south of the boundary where the first stage treatment facilities would be built. The Project also provides for collection and pumping of the sanitary wastewaters from the "Playas de Tijuana", subdivision west of the city, to discharge those waters into the beforementioned gravity conveyance canal at a point 2.1 miles (3.4 km) north of the site for the planned treatment facilities.

The first stage treatment facilities provided in the project are designed to treat an average discharge in the range of 34 to 50 mgd (1500 to 2200 lps), and will consist of two modules, each designed to treat an average discharge in the range of 17 to 25 mgd (750 to 1100 lps). Although the facilities could treat such range of average discharges, the peak inflow to the plant with two modules will be limited by the maximum capacity of the conveyance facilities to a peak of 62 mgd (2700 lps) which corresponds to an average of 34 mgd (1500 lps), using a peak to average ratio of 1.8. Treatment in each module will be effected by means of facultative aerated and polishing lagoons. The effluent from the plant would be used partially for irrigation of nearby lands and the remaining part is to be chlorinated and conveyed about 1.6 miles (2.6 km) farther south, to a point 5.6 miles (9.0 km) south of the boundary where it will be discharged to the ocean. The characteristics for the treatment facilities plan, including the quality of effluent to be achieved, are set forth in detail in the previously mentioned attachment.

The Commissioners examined the schedule prepared by Mexico for construction of the treatment and disposal facilities and the related table of estimated increases in the discharge of sanitary wastewaters that will require treatment and disposal. The Commissioners noted, as has been observed on the ground, that the pumping plant and the pressure and gravity conveyance conduits are near completion and will be in operation by June 1985, and that construction has started on the works planned for disposal of the sanitary wastewaters from Playas de Tijuana and that these works are to be completed by March 1986. They noted that the first module of the treatment plant will be completed by December 1986. They noted that the second module of the treatment plant will be completed by the time the flow of wastewaters requiring treatment exceeds an average discharge of 25 mgd (1100 lps). Referring to the beforementioned table of discharge increases, they noted that the discharge of sanitary wastewaters requiring treatment is expected to reach the total capacity of the first stage treatment facilities by 1989, and that the Project provides that by that date the second stage facilities will be completed and in operation.

The Commissioners then considered the comments of the technical group, consisting of engineers of the Commission, the Environmental Protection Agency of the United States, and the Secretariat of Urban Development and Ecology of Mexico on the plans presented by Mexico for the first stage facilities for treatment and disposal of the sanitary wastewaters, and noted that the group expressed satisfaction with the conceptual bases and the progress of such plans. They noted that the plans presented did not bring out observations that could result in modifications. They also noted that the present discharges of wastewaters, taken as the bases for scheduling the construction of the facilities, should be verified by measurements in the conveyance canal once the new pumping installations are in operation.

The Commissioners agreed that the planned treatment and disposal facilities of the first stage of the Integrated Project will provide a solution to the Tijuana sanitation problem until about 1989, if designed, constructed, operated and maintained so as to prevent discharge of untreated sanitary and industrial wastewaters across the international boundary and to assure that the quality of the treated wastewaters discharged to the ocean and reaching the international boundary meet the present quality criteria of the United States and Mexico for primary contact recreation use of such waters. They referred to the construction schedule and agreed that it is essential that the planned treatment and disposal facilities corresponding to the first stage of the Integrated Project, as well as the subsequent facilities needed for the second stage, be constructed in a timely manner to assure the treatment capacity needed in advance of the rate of discharge of sanitary wastewaters collected.

Accordingly, the Commission agreed to submit for approval of the two Governments the following

RESOLUTION:

1. That Mexico proceed to construct, operate and maintain the sanitary wastewater treatment and disposal facilities which form a part of the first stage of the Integrated Project for Potable Water and Severage, prepared by Mexico for the city of Tijuana, Baja California, in conformance with SEDUE'S plan described herein.

2. That Mexico design, construct, operate and maintain the treatment and disposal facilities for the city of Tijuana to prevent discharges of untreated sanitary and industrial wastewaters across the international boundary in the San Diego-Tijuana area.

3. That the design and construction of the sanitary wastewater treatment and disposal facilities planned by Mexico include standby equipment to be utilized during periods of breakdowns or maintenance of the installations.

4. That Mexico operate and maintain the first stage treatment and disposal facilities so that the quality of the coastal receiving waters at the international boundary comply with the water quality criteria established for primary contact recreation uses: "the most probable number of coliform bacteria will be less than 1,000 organisms per 100 milliliter (ml), provided that not more than 20% of the total monthly samples (at least 5) exceed 1,000 per 100 ml, and that no single sample taken during a verification period of 48 hours should exceed 10,000 per 100 ml".

5. That prior to the initiation of construction, Mexico provide to the Mexican Section for the Commission's joint review and approval, copies of SEDUE'S plans and designs for construction of the first stage treatment and disposal facilities and its plans for operation and maintenance including monitoring and supervision, and that each Section inform the appropriate Agencies of its Government of any deficiency.

6. That Mexico progress in the construction of the treatment and disposal facilities in accordance with the approved plans and specifications and in such a timely manner that the installed capacity of the facilities is not exceeded by the rate of discharge of collected sanitary wastewaters.

7. That Mexico take the necessary measures to assure the timely availability of sufficient funds to carry out the construction of the treatment and disposal facilities of the first stage of the Integrated Project, in accordance with the previous paragraph and the corresponding plans and specifications.

8. That Mexico take the necessary measures to annually assure that sufficient funds are timely available to operate and maintain the first stage treatment and disposal facilities, including preventative maintenance, to enable performance of these functions in a manner that will assure insofar as possible against breakdowns or interruptions.

9. That in the event of a breakdown or interruption in the operation of the treatment and disposal facilities of the first stage, Mexico take special measures to make the immediate repairs; and that if Mexico requests through the Commission, the United States Section seek to make arrangements so that its country can provide assistance to Mexico so that the repairs can be made immediately through and under the supervision of the Commission. In the event of uncontrolled flows of Tijuana wastewaters across the boundary into the United States, Mexico will accept in its treatment and disposal system such Tijuana wastewaters as may be collected in the United States for conveyance to the Mexican system in a volume not to exceed that of the uncontrolled wastewaters.

10. That in accordance with Article 2 of the 1944 Water Treaty, the construction, operation and maintenance of the wastewater treatment and disposal facilities be jointly observed by representatives of the Commission, and each Section of the Commission inform the appropriate agencies of its Government of the results of the observations.

11. That the Commission attempt to arrange as soon as possible an agreement for continued use of the emergency connection to the metropolitan system of the city of San Diego during the interim period until the first module of the treatment plant is completed, in terms acceptable to the appropriate authorities of each country.

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12. That Mexico initiate immediately the studies and designs of alternatives for the subsequent treatment and disposal facilities needed for the second stage of the Integrated Project with the objective of presenting the plans in a timely manner for consideration of the Commission for its approval in accordance with the aforestated criteria that the installed capacity of the treatment facilities shall not be exceeded by the rate of discharge of sewage collected, and that during these studies, Mexico consult with the Commission through the Mexican Section, and that Mexico upon adoption of a definite plan, present it with the corresponding construction schedule, to the Commission for its approval and recommendation to the two Governments.

13. That this Minute requires the specific approval of the two Governments.

The meeting was adjourned.

J. F. Friedkin
U.S. Commissioner

Joaquin Bustamante R.
Commissioner for Mexico

M. R. Ybarra
U.S. Section Secretary

Lorenzo Padilla S. P.
Mexican Section Secretary

INTERNATIONAL BOUNDARY AND WATER COMMISSION

UNITED STATES AND MEXICO

Minute No. 283

El Paso, Texas
July 2, 1990

CONCEPTUAL PLAN FOR THE INTERNATIONAL SOLUTION TO THE BORDER SANITATION PROBLEM IN SAN DIEGO, CALIFORNIA/TIJUANA, BAJA CALIFORNIA

The Commission met in the offices of the United States Section in El Paso, Texas on July 2, 1990, at 10:00 a.m., to consider a conceptual plan for an international solution which would provide for the proper collection, treatment and final disposal of sewage in excess of the capacities of existing facilities in San Diego, California/Tijuana, Baja California.

The Commissioners noted the interest of the United States and Mexican Governments at the meeting of United States President George Bush and Mexican President Carlos Salinas de Gortari October 3, 1989 in Washington, D.C., expressed by United States Secretary of State James A. Baker, III and Mexican Foreign Relations Secretary Fernando Solana in their diplomatic notes of that date that the Commission conclude a Minute on the referenced conceptual plan at the earliest time possible.

The Commissioners noted the stipulations in the Treaty between the United States of America and the United Mexican States for the "Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande", dated February 3, 1944 as they relate to the obligation of both Governments to provide preferential attention to the solution of border sanitation problems; the stipulations in Minute No. 261, entitled "Recommendations for the Solution to the Border Sanitation Problems", dated September 24, 1979, as they relate to prevention, standards and joint actions for solution of border sanitation problems; and implementation by the Government of Mexico of Minute No. 270, entitled "Recommendations for the First Stage Treatment and Disposal Facilities for the Solution of the Border Sanitation Problem at San Diego, California/Tijuana, Baja California", dated April 30, 1985.

The Commissioners concurred with the steady progress by the Government of Mexico to implement the measures stipulated in Minute No. 270 and made note of the intention of the Government of Mexico to construct, along the right bank of the Rio El Alamar, the second treatment plant module envisioned in Minute No. 270. The Commissioners also reviewed the conclusions from meetings which took place on July 23, 1987 in Ciudad Juarez, Chihuahua and July 24, 1987 and September 9, 1988 in El Paso, Texas in order to comply with resolutions Nos. 6 and 12 of Minute No. 270 as they relate to studies and designs for alternatives for the subsequent sewage treatment and final disposal facilities for the city of Tijuana, Baja California.

The Commissioners noted that sewage in the cities of San Diego, California and Tijuana, Baja California area is handled as follows:

1. Sewage generated in the southern area of the city of San Diego, California is conveyed northwards by pumping facilities and pressure and/or gravity lines to the Point Loma advanced primary treatment plant. The treated sewage is discharged to the Pacific Ocean through an 11,500 feet (3.4 kilometers) long deep ocean outfall at a point 13.5 miles (21.67 kilometers) north of the international boundary.

2. Sewage generated in the city of Tijuana, Baja California is conveyed southwest of the city by pumping facilities and pressure and/or gravity lines to a secondary sewage treatment plant located at San Antonio de los Buenos which has a capacity of 25 mgd (1100 lps). The treated sewage is discharged to the Pacific Ocean at a point 5.6 miles (9.0 kilometers) south of the international boundary.

3. Uncontrolled discharges from Mexico into the United States at Smuggler Gulch (Canon del Matadero), and El Sol Canyons, which include two nearby drains, are intercepted through works in the United States and are returned to the city of Tijuana, Baja California's final disposal system. At times, part of the discharges from Mexico, due to outages at Pumping Plant No. 1, are conveyed in the San Diego, California sewage collection and treatment system in conformance with stipulations in Commission Minute No. 222, entitled "Emergency Connection of the Sewerage Collection System of the City of Tijuana, Baja California to the Metropolitan Sewerage System of the City of San Diego, California," dated November 30, 1965. It has not been possible to eliminate uncontrolled sewage that continuously flows in

amounts of 0.11 mgd (5 lps) at Goats Canyon (Canon de los Laureles) and of 10 mgd (438 lps) in the Tijuana River, respectively.

The United States Commissioner informed that the city of San Diego, California has a comprehensive study underway to upgrade its potable water and sewage collection and treatment systems. One of the treatment plants in the United States could be located in the Tijuana River Valley. The city of San Diego, California, the State of California, and the United States Federal Government, the responsible entities in this country charged with these matters, are obligated to pay the costs associated with sewage treatment for the city of San Diego, California.

The Mexican Commissioner informed that his Government has financed the construction and operation and maintenance of Module I of the first stage sewage treatment facilities for the city of Tijuana, Baja California with a capacity of 25 mgd (1100 lps), based on the agreements in Minute No. 270, and that his Government plans to construct a secondary treatment plant for the sewage generated in east Tijuana, Baja California, in place of the second module of the first stage treatment facilities for that city. The new secondary treatment plant would discharge its effluent into the Rio El Alamar, a tributary of the Tijuana River. The United States Commissioner reported that his Government wishes to propose a binational secondary treatment plant solution in the city of San Diego, California for which the cost to Mexico for construction, operation and maintenance would be equivalent to that of the Rio El Alamar treatment plant.

The Commissioners considered that participation by Mexico in the construction, operation and maintenance of an international wastewater treatment plant in the United States in the manner outlined above is a satisfactory alternative to meet the commitment in Minute No. 270 for the construction of the second module of the first stage treatment facilities for the city of Tijuana, Baja California. At the same time, they considered that the Commission should jointly determine the real costs of the construction, operation and maintenance of the secondary treatment plant proposed along the Rio El Alamar.

The United States Commissioner stated that even with secondary treatment and disinfection provided to sewage from an international plant, the United States authorities charged with water quality would require a deep ocean discharge at the downstream end of the land outfall for final disposal of effluent at a point to be selected upon completion of oceanographic studies. Because water quality standards are more strict in the United States, the construction, operation and maintenance of the land and deep ocean outfalls would be financed by the United States in recognition of the potential benefits to the Tijuana River Estuary and United States beaches in south San Diego County, California.

The Commissioners then analyzed plans in the United States and Mexico for construction of sanitation facilities in San Diego, California and the city of Tijuana, Baja California. These are:

1. Completion in Mexico of the works planned for Tijuana, Baja California in the construction plans of the Integrated Project for Potable Water and Sewerage including a gravity sewer trunkline from Tijuana Pumping Plant No. 1 to the boundary.

2. Construction in Mexico of sewage collection works necessary to convey to the international sewage treatment plant, city of Tijuana, Baja California sewage that would have been treated at the Rio El Alamar treatment plant.

3. Construction in the United States of an international secondary treatment sewage plant with disinfection and capacity of at least 25 mgd (1100 lps) to treat sewage generated in excess of the capacity of the conveyance and treatment facilities of the first stage works constructed by Mexico in accordance to the recommendations in Minute No. 270, to be located near Dairy Mart Road.

4. Construction in the United States of a pipeline system with capacity of at least 25 mgd (1100 lps) to convey the international treatment plant effluent to the coastal surf waters.

5. Construction in the United States of a deep ocean outfall system with a capacity to discharge into the Pacific Ocean at least 25 mgd (1100 lps) of treated sewage from the international plant. The length of this outfall will be based on the results of oceanographic studies.

The Commissioners agreed that the construction and operation of the conveyance, treatment and final disposal works above described, would permanently and definitively resolve the existing border sanitation problem and concluded that the joint solution is the best alternative to this common problem. At the same time, they agreed that reuse of the treated sewage by each country is desirable at such time as either country may consider it opportune and arranges for construction of the necessary works.

The Commission then adopted the following recommendations for the approval of the two Governments:

1. Participation by the Government of Mexico in the construction, operation and maintenance of an international treatment plant in the United States in place of the construction of the second module of the first stage sewage treatment facilities for the city of Tijuana, Baja California, initially planned in Commission Minute No. 270.

2. Completion at Mexico's expense of the sewage collection system for the city of Tijuana, Baja California in accordance with the respective integrated project and operation and maintenance at Mexico's expense of that system and the conveyance, treatment and disposal facilities constructed under Minute No. 270.

3. Construction at the expense of the United States and Mexico of the necessary sewage collection works to convey to the international sewage treatment plant, sewage from the city of Tijuana, Baja California that would have been treated in the Rio El Alamar treatment plant. The cost corresponding to the United States shall be in an amount not to exceed $4 million, United States currency, to be provided in a manner determined by the two Governments through the Commission. The Government of Mexico at its expense will assure completion of the construction of these sewage collection works. The operation and maintenance of these works shall be charged to Mexico.

4. The final design and joint construction between the United States and Mexico of an international secondary treatment plant with disinfection facilities, sludge digesters and sludge transport vehicles, to be located in United States territory at a site known as Dairy Mart Road. The construction will be in modules with approximate capacity of 25 mgd (1100 lps) and both Governments will determine the maximum treatment capacity as soon as possible. The site

of the international treatment plant will be in a construction area outside of an environmental protection area, the latter located between the international boundary and the construction area.

5. Construction and operation and maintenance in the United States at United States expense, of a pipeline system with a capacity of at least 25 mgd (1100 lps) to convey treated sewage from the international treatment plant to the coastal surf waters.

6. Construction, operation and maintenance in the United States at United States expense, of a deep ocean outfall with an estimated length to be determined by the results of oceanographic studies and a capacity to discharge into the Pacific Ocean at least 25 mgd (1100 lps) of treated sewage from the international plant.

7. The cost of construction, operation and maintenance of the international treatment plant shall be covered by the United States and Mexican Governments. The cost corresponding to Mexico shall be in an amount, to be determined by the two Governments through the Commission, equal to that which would have been used in the construction, operation and maintenance of the treatment plant planned for the Rio El Alamar. The costs of construction corresponding to Mexico shall be covered in 10 annual payments, each equal to one-tenth of total construction cost determined by the two Governments through the Commission, beginning at the time that the international treatment plant enters into operation. The costs for operation and maintenance corresponding to Mexico shall be paid annually. The United States Government shall cover the difference between these costs and those that result from the construction, operation and maintenance of the international treatment plant.

8. The final design, the specific division of construction, operation and maintenance costs, the division of work to be carried out by each country and the construction and expenditures schedules corresponding to each country for the international treatment plant, will be established by the Commission in subsequent Minutes, subject to the approval of the two Governments. Standards, criteria and restrictions, including those for odor control, applicable in the city of San Diego and the state of California,

will be utilized in the design, construction and operation of the international treatment plant.

9. The Government of Mexico could cover part or all of the costs corresponding to Mexico for the operation and maintenance of the international plant through the supply of electrical energy for operation of the international treatment plant.

10. The Government of Mexico at a cost to Mexico shall dispose, in its territory, the sludge resulting from treatment of the city of Tijuana, Baja California sewage in the international treatment plant. Mexico would receive such sludge from the international sewage treatment plant in the United States in vehicles operated by Mexican personnel employed directly or indirectly in the operation and maintenance of the international treatment plant.

11. The Governments of the United States and Mexico reserve the right to dispose in their own territory part or all of the untreated sewage, in a manner consistent with the desire of both Governments expressed in Minute No. 261 of the Commission to prevent border sanitation problems. Also, both Governments reserve the right to return for reuse in their respective territories part or all of the international treatment plant effluent corresponding to each country's sewage inflows. The cost of construction of works to allow reuse of the effluent from the international treatment plant will be covered by the Government benefitting from such reuse.

12. The Government of Mexico, in accordance with laws in force in that country, in order to assure efficient treatment of Tijuana sewage in the international plant, will require all industries to provide appropriate pre-treatment of wastewaters that those industries may discharge into the Tijuana sewage collection system which would in turn discharge into the international sewage treatment plant.

13. Any sanitation facilities constructed in the Tijuana River Valley, in addition to those contemplated for this international project shall contemplate, consistent with laws in force in each country, measures necessary to avoid negative impacts in

outlying urban areas on both sides of the international boundary.

14. Consistent with Articles 2, 20, and 23 of the Water Treaty of February 3, 1944, the construction, operation and maintenance of the international treatment plant shall be under the supervision of the International Boundary and Water Commission, United States and Mexico. Similarly the design and construction of the works necessary to convey to the international treatment plant sewage from the city of Tijuana, Baja California that would have been treated in the Rio El Alamar treatment plant shall be under the supervision of the Commission. The construction of jointly financed works in the territory of each country, shall in no way confer jurisdiction to one country over the territory of the other.

15. Upon approval of this Minute by the United States and Mexican Governments the Principal Engineers of both Sections will develop and carry out an appropriate program of sampling and analysis of the water quality of inflows into the Tijuana River that would be captured by collection works in Mexico for conveyance to the international treatment plant.

16. The Government of Mexico will assure that there are no discharges of treated or untreated domestic or industrial wastewaters into waters of the Tijuana River that cross the international boundary, and that in the event of a breakdown in collection or other detention facilities designed to prevent such discharges, the Government of Mexico will take special measures to immediately stop such discharges and make repairs. Should Mexico request it through the Commission, the United States Section will attempt to assist with equipment and other resources in the containment of such discharges and temporary repairs under the supervision of the Commission.

17. This Minute requires the specific approval of the two Governments, and shall enter into force upon such approval with the understandings that: a) the funds to cover the costs to the United States are subject to the availability of those funds, b) the advance payment by the United States Government, in the amount to be determined by the Commission to be reimbursed by the Government of Mexico is also

subject to the availability of funds and c) that the Mexican Commissioner notify the United States Commissioner that the Secretariat of Planning and Budget of Mexico has approved the financing of this joint project corresponding to Mexico.

The meeting was adjourned.

Narendra N. Gunaji United States Commissioner	J. Arturo Herrera Solis Interim Mexican Commissioner
Manuel R. Ybarra United States Section Secretary	Jose de Jesus Luevano Grano Acting Mexican Section Secretary

INTERNATIONAL BOUNDARY AND WATER COMMISSION

UNITED STATES AND MEXICO

Minute No. 296

April 16, 1997
El Paso, Texas

DISTRIBUTION OF CONSTRUCTION, OPERATION AND MAINTENANCE COSTS FOR THE INTERNATIONAL WASTEWATER TREATMENT PLANT CONSTRUCTED UNDER THE AGREEMENTS IN COMMISSION MINUTE NO. 283 FOR THE SOLUTION OF THE BORDER SANITATION PROBLEM AT SAN DIEGO, CALIFORNIA/TIJUANA, BAJA CALIFORNIA

The Commission met in the offices of the United States Section in El Paso Texas at 8:00 a.m. on April 16, 1997 to recommend to the two Governments the specific distribution costs of construction, operation and maintenance of the International Wastewater Treatment Plant (IWTP) under the terms of International Boundary and Water Commission (IBWC) Minute No. 283, entitled, "Conceptual Plan for the Solution of the Border Sanitation Problem in San Diego, California/Tijuana, Baja California," signed July 2, 1990.

The Commissioners observed that in Resolution No. 8 of Minute No. 283 the IBWC should recommend, for the approval of the two Governments, the specific cost corresponding to each country for the construction, operation and maintenance of the IWTP.

A. General

The Commissioners reviewed the activities carried out by each country in furtherance of Minute No. 283 and made the following observations:

- o Mexico is completing the sewage collection works and the work necessary in Mexico to convey the collected Tijuana sewage to the IWTP.
- o The United States is completing the construction of the IWTP and conveyance and ocean discharge system. The United States is scheduled to complete construction and begin operation in April 1997 of the advanced primary treatment module with a capacity of 25 million gallons per day (mgd) or 1100 liters per second (lps). The United States has developed an operations and maintenance manual for the advanced primary treatment module. A secondary treatment module is under design and an environmental review is underway to determine the best alternative to achieve secondary treatment. Construction of the outfall system for ocean discharge is underway with completion scheduled for 1998. Also, the Commissioners continue to analyze the environmental studies being

conducted in the United States as part of an analysis of alternatives to best achieve secondary treatment.

o The IBWC Commissioners have coordinated, with the responsible authorities in each country, the necessary actions for treatment at the plant site and removal to Mexico of the sludge generated from Tijuana wastewaters in the advanced primary treatment module. The sludge will be removed from the IWTP each day. Mexico is completing arrangements for disposal, in its territory, of the sludge at a site approved for such disposal in accordance with applicable Mexican legislation.

o The United States is considering alternatives for the interim discharge of the advanced primary treated effluent. The alternatives include a) continued use of the emergency connection up to 13 mgd (570 lps), b) discharge to the Tijuana River of advanced primary treated effluent, and c) return of an advanced primary treated effluent to Mexico. The Commissioners observed that in the case that the alternative for temporary discharge of an advanced primary treated effluent to Mexico is selected, the IBWC would support the necessary arrangements for the construction of an appropriate conveyance and disposal system in Mexico that would be properly coordinated with Pumping Plant No. 1 in Tijuana. They also observed that in case of a temporary discharge of primary treated effluent using the emergency connection to the City of San Diego, Mexico's cooperation would be necessary to handle, to extent possible, the flows generated in excess of the emergency connection capacity.

o The IBWC Commissioners observed the progress in the Tijuana wastewater characterization programs for wastewaters that would be conveyed to the IWTP. The data will allow a) identification of pollutant limits that would protect the efficiency of the IWTP and b) delivery of data to Mexico for Mexico's implementation of its industrial wastewater pretreatment programs in Tijuana based on standards in Mexico. Under such programs discharges of industrial wastewaters into this system must not exceed limits for non-conventional pollutants. The Commissioners considered it appropriate that the IBWC, with the expert recommendation of the specialized water quality agencies of each country, should determine the limits of pollutant concentrations that if exceeded would harm the plant's efficiency. The Commissioners observed that the Commission would monitor the plant's effluent for non-conventional pollutants each six months and more frequently in the event that excessive concentrations of non-conventional pollutants are detected. The results would be provided to the appropriate officials in Mexico so that those officials can identify the source of these pollutants and apply the appropriate laws. As the IWTP is located in the United States and will discharge to the coastal waters in the United States, the ocean discharge must meet quality standards established in the United States, under a permit granted to the United States Section of the IBWC.

- The Mexican Commissioner informed that Mexico continues to evaluate alternatives for treatment of future Tijuana sewage in excess of the 25 mgd (1100 lps) assigned for Tijuana in the IWTP, which at an opportune time will be discussed before the IBWC in the context of Minute No. 261. In such case, the IBWC would determine whether it is practical to expand the IWTP to handle Tijuana flows in excess of the 25 mgd (1100 lps) assigned to Mexico in the IWTP and, if so, make recommendations on the terms of Mexico's financial participation in such expansion.

B. Distribution of Construction, Operation and Maintenance Costs

The Commissioners noted that discussions were held by the Principal Engineers of the IBWC on studies developed by Mexico's National Water Commission (CNA) regarding the costs of construction, operation and maintenance of the wastewater plant that Mexico planned to construct in the Rio Alamar, had Mexico not participated in the international plant. The Commissioners reviewed the information presented by the Principal Engineers and considered, as appropriate, the amount of $16.8 million (U.S. currency) as the cost that Mexico would have expended to construct a treatment plant (Rio Alamar plant) in Mexico. Under the terms of Resolution No. 7 of Minute No. 283, Mexico would cover this corresponding share in 10 annual installments of $1.68 million each upon the start of the IWTP operation, with the first payment due on December 15, 1997. The payment method was developed in a consensus with the Comisión Estatal de Servicios Públicos de Tijuana (CESPT), and the CNA to make the necessary adjustments in an internal cash flow that will allow payment in the amount corresponding to Mexico. This procedure will be followed for subsequent payments toward the total amount to cover the payment on December 15 of each year.

The Commissioners also reviewed the information presented by the Principal Engineers, in Exhibit A, and considered, as appropriate for the capacity of 25 mgd (1100 lps), the amount of $0.034 per cubic meter (U.S. currency) as the cost that Mexico would have expended in 1997 in the operation and maintenance of the Rio Alamar plant. They observed that for subsequent years, adjustments in costs, as needed, would be applied based on Mexican economy. The CESPT should participate in the annual review of the operation and maintenance costs to enable this organization to incorporate such increases in its budget in subsequent years. Further, the Commissioners observed that Mexico, through CESPT, should begin to cover its part of the costs of the IWTP operation and maintenance once the treatment plant is in operation. Such payments will be made in quarterly. The monthly payments would be made within 10 days of the month corresponding to the end of each quarter. The payment schedule was defined in a consensus with the CESPT allowing for necessary internal cash flow adjustments to cover the payment. A cost adjustment factor would be estimated for the next year based on the prior year's performance. A final accounting would be performed at the end of the year.

The Commissioners considered that the two Sections of the Commission will ensure, at least once a month, a systematic exchange and sharing of information with the CESPT and the agency responsible for the IWTP operation, hydrometric data generated through IWTP system measuring devices, including but not limited to, influent from Mexico in order to carry out an adequate accounting of the flows delivered for treatment at the IWTP as well as effluent from the IWTP. The Commissioners considered it appropriate for the Principal Engineers to develop a similar program for the effluent data generated from the treatment and ocean discharge systems in the United States and Mexico before the ocean outfall operations begin.

Finally, the Commissioners observed that in the event that Tijuana wastewaters from canyon and other collectors as may be conveyed for treatment at the IWTP, the operations and maintenance costs that Mexico would cover for these volumes would be the same as those in the prior paragraphs, that is $0.034 per cubic meter of sewage treated. The Mexican Section will inform the United States Section in a timely manner of such discharges and their estimated volumes. The volumes would exclude flows from ruptured drinking water lines and from storm runoff. The payments for treatment of these wastewaters will be covered in the quarterly payment by Mexico for the waters conveyed to the IWTP in the international collector up to the capacity of 25 mgd (1100 lps). Should the discharges from all of these points exceed an average of 25 mgd (1100 lps), computed each quarter, the Commission will determine the costs chargeable to Mexico for treating such excess discharges.

Based on the above considerations, the Commissioners adopted the following resolutions for the approval of the two Governments:

1. The IWTP construction costs chargeable to Mexico will be $16.8 million (United States currency) an amount which corresponds to the total amount that Mexico would have expended to construct the Río Alamar treatment plant, had Mexico not participated in construction of the IWTP. Mexico will pay this amount to the United States in 10 annual fixed installments of $1.68 million (United States currency) each upon the start of the IWTP operations, with the first annual payment to be provided on December 15, 1997. The payment method was developed in a consensus with the Comisión Estatal de Servicios Públicos de Tijuana (CESPT), and the CNA to make the necessary adjustments in an internal cash flow that will allow payment in the amount corresponding to Mexico. This procedure will be followed for subsequent payments toward the total amount to cover the payment on December 15 of each year.

2. The operation and maintenance costs of the IWTP chargeable to Mexico for up to 25 mgd (1100 lps) will be $0.034 per cubic meter (U.S. currency) as the cost that Mexico would have expended in 1997 in the operation and maintenance of the Rio Alamar plant. In subsequent years, adjustments, as needed, to costs would be applied based on Mexican economy. The CESPT should participate in the annual review of the operation and maintenance costs to enable this organization to incorporate, in a timely manner, such increases in its budget in subsequent years. Cost adjustment factors would be estimated for the next year based on the prior year's performance. A final accounting would be performed at the end of the year.

3. For the construction and operations and maintenance payments, the Mexican Section of the IBWC will collect the amounts corresponding to the CESPT and, where appropriate, to the CNA in order to complete the payment to the U.S. Section of the IBWC in accordance with IBWC procedures in effect for these purposes.

4. Mexico will begin to cover its proportionate costs of the IWTP operation and maintenance corresponding to point 2) upon the start of operations of the IWTP. The quarterly payment will be made within 10 days after the end of each quarter, in a procedured developed in a consensus with the CESPT for the necessary internal cash flow adjustments that will allow its payment.

5. The United States Section will provide to the Mexican Section a copy of the operations and maintenance manual developed for the IWTP to allow the responsible Mexican authorities to understand the IWTP operations criteria.

6. In the event that Tijuana wastewaters from canyon and other collectors are conveyed for treatment at the IWTP, the operations and maintenance costs that Mexico through the CESPT would cover for these volumes would be the same as those in the prior paragraphs, that is $0.034 per cubic meter of sewage treated. The Mexican Section, with the prior consultation with the CESPT, will inform the United States Section in a timely manner of such discharges and their estimated volumes which would not include drinking water from ruptured lines or storm runoff. The payments for treatment of these wastewaters will be incorporated by the CESPT in the quarterly payment by Mexico for the waters conveyed to the IWTP in the international collector up to the capacity of 25 mgd (1100 LPs). In the event that discharges from all of these points exceed an average of 25 mgd (1100 LPs), assigned to Mexico, computed each quarter, the Commission

will determine the charges to Mexico corresponding to treat the excess discharges.

7. The two Sections of the Commission will ensure, and at least monthly, a systematic exchange of information with the CESPT and the agency responsible for the IWTP operation, hydrometric data generated through IWTP system measuring devices, including but not limited to, influent from Mexico in order to carry out an adequate accounting of the flows delivered for treatment at the IWTP as well as effluent from the IWTP. The Commissioners consider it appropriate that the Principal Engineers develop a similar program for the effluent data generated from the effluent data generated from the treatment and ocean discharge systems in the United States and Mexico before the ocean outfall operations begin.

8. The IBWC will review, in the context of Minute No. 261, alternatives being considered by Mexico for treatment of future Tijuana sewage in excess of the 25 mgd (1100 lps) identified for Tijuana in the IWTP. As part of this review, the IBWC will make recommendations to the governments as to the practicality of expanding the IWTP to handle flows in excess of 25 mgd (1100 lps) assigned to Mexico in the IWTP and if so, develop recommendations for the terms of Mexico's financial participation in such expansion.

9. The IBWC will continue to analyze the environmental studies being conducted in the United States regarding alternatives for the best means of achieving secondary treatment.

10. The Commission will continue to characterize inflows to the IWTP and determine, with the expert recommendation of the appropriate water quality authorities of each country, the limits of pollutant concentrations in the system that, if exceeded, would harm the efficiency of the international plant. The Commission will monitor inflows at the international boundary for potential exceedences and provide the information to the Government of Mexico so that the proper authorities in Mexico can apply those limits in applying appropriate pretreatment laws.

11. In case of an interim discharge of advanced primary treated effluent to Mexico, the IBWC will make the necessary arrangements for an appropriate conveyance and disposal infrastructure system in Mexico.

12. In the case of an interim discharge of advanced primary treated effluent utilizing emergency connection to the city of San Diego, the cooperation

of Mexico would be necessary to handle, to the extent possible, the flows in excess of the emergency connection capacity as may be generated.

13. The IBWC will review and recommend to the two Governments the additional infrastructure needed to collect sewage that is currently discharged to the Tijuana River through storm and other drains such that there is no discharge of untreated sanitary or industrial wastewaters in the international boundary between San Diego and Tijuana.

14. All activities carried out pursuant to this Minute will be subject to the availability of appropriated funds, resources and personnel and applicable laws and regulations of each country.

15. This Minute shall enter into force when the Government of the United States of America and the Government of the United Mexican States have each provided written notification through their Section of IBWC of its approval.

The meeting was adjourned.

John M. Bernal
United States Commissioner

J. Arturo Herrera Solís
Mexican Commissioner

Manuel R. Ybarra
United States Section Secretary

José de Jesús Luévano Grano
Mexican Section Secretary

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

El Paso, Texas
February 20, 2004

MINUTE NO. 311

RECOMMENDATIONS FOR SECONDARY TREATMENT IN MEXICO OF THE SEWAGE EMANATING FROM THE TIJUANA RIVER AREA IN BAJA CALIFORNIA, MEXICO

The Commission met at the offices of the United States Section in El Paso, Texas on February 20, 2004 at 1:30 p.m., to address the construction in Mexico of a plant and related facilities for secondary treatment of sewage emanating from the Tijuana River area in Mexico that flows untreated into the United States or is partially treated at the South Bay International Wastewater Treatment Plant (SBIWTP) located in San Ysidro, California.

The Commissioners noted the stipulations in the Treaty between the United States of America and the United Mexican States for the "Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande," signed February 3, 1944, as they relate to the obligation of both Governments to provide preferential attention to the solution of border sanitation problems. They also noted the stipulations in Minute No. 283, entitled "Conceptual Plan for the International Solution to the Border Sanitation Problem in San Diego, California/Tijuana, Baja California," dated July 2, 1990, that provided for the United States and Mexico to design, construct, operate and maintain a treatment plant for up to 25 million gallons per day (mgd) <1100 liters per second (l/s)> of wastewater arriving from the City of Tijuana, Baja California to be treated to a level of secondary treatment in the United States. The Commissioners also noted that the Mexican Government covers the costs of operation and maintenance of the volumes mentioned above in its corresponding portion, in accordance with Minute No. 296, entitled "Distribution of Construction, Operation and Maintenance Costs for the International Wastewater Treatment Plant Constructed under the Agreements in Commission Minute No. 283 for the solution of the Border Sanitation Problem at San Diego, California/Tijuana, Baja California," dated April 16, 1997. Likewise, they noted that due to problems in the United States the level of treatment provided by the present international plant is only at a level of advanced primary treatment.

The United States Commissioner noted that the level of treatment provided at the SBIWTP currently fails to meet the secondary treatment level standard set forth in the State of California discharge permit. The concentration and mass emissions rates for total suspended solids and Carbonaceous Biochemical Oxygen Demand and Whole Effluent Toxicity have routinely exceeded the permit levels since the initiation of advanced primary treatment in 1997. In addition, the United States Commissioner noted the failure to meet discharge permit requirements had resulted in litigation in Federal District Court. The United States Commissioner further noted that a possible result of this lawsuit is that the United States Section would be required to cease discharges from the SBIWTP. The Mexican Commissioner noted that this would mean that the SBIWTP could not accept any flows from Mexico and this would not be acceptable to Mexico. Both Commissioners noted that this would have serious impacts on health and the environment in the border region.

The Commissioners noted passage by the United States Congress of Public Law 106-457, "Tijuana River Valley Estuary and Beach Cleanup" signed on November 7, 2000, which authorizes appropriation of up to $156 million dollars to comprehensively address the treatment of sewage emanating from the Tijuana River area in Mexico that flows untreated or partially treated into the United States causing significant adverse public health and environmental impacts. They also considered the proposal presented by the United States Section to the Mexican Section through correspondence in January 2002. The implementation of a secondary treatment facility in Mexico in a manner consistent with Public Law 106-457 would provide the secondary treatment which was originally to be provided at the SBIWTP in conformance with Minute No. 283.

The Commissioners noted the efforts of the Comisión Estatal de Servicios Publicos de Tijuana and of the United States Environmental Protection Agency (USEPA) in the development of the Master Plan for Water and Sanitation for the City of Tijuana, Baja California, published on March 7, 2003, which analyzes the present and future generation of wastewater in the City of Tijuana, the available treatment capacity at present, and the facilities required to cover the treatment needs through 2023. The Mexican Commissioner noted that the United States proposal for constructing the secondary treatment for the SBIWTP in Mexico would complement the provisions in the City of Tijuana Master Plan until 2023 that suggests the construction of a wastewater treatment plant with total treatment capacity of 33.5 mgd (1470 l/s). In addition the Master Plan considered secondary treatment consisting of 25 mgd (1100 l/s) of the SBIWTP advanced primary effluent, if secondary treatment of that effluent is not provided for at a facility in the United States. This increases the total needed capacity for the planning period to 2023 to 59 mgd (2570 l/s).

I. PROPOSED PROJECT

The Commissioners considered it possible to implement the concept of the referenced United States proposal in Mexico for a secondary treatment facility for sewage emanating from the City of Tijuana, Baja California, under a public-private participation arrangement. The United States Section would agree to fund, subject to availability of annual appropriations, up to $156 million for the engineering, construction, and for a period of 20 years for the operation and maintenance of a 59 mgd (2570 l/s) wastewater treatment plant in Mexico if the treatment of 25 mgd (1100 l/s) of advanced primary effluent of the SBIWTP is not provided in the United States. Any additional costs will be subject to subsequent Commission agreements. The Government of Mexico would continue to cover the corresponding costs for the first 25 mgd (1100 l/s) as stipulated in Minutes Nos. 283 and 296.

Specifically, the proposed project will consider at a minimum the following:

- To locate the required primary and/or secondary treatment facilities in Mexico and associated facilities directly related to the project in the United States and Mexico.
- To provide secondary treatment of the SBIWTP effluent in Mexico, if such treatment is not provided for at facilities located in the United States.
- To provide the treatment capacity, including all processes necessary to provide secondary treatment level, in Mexico, for flows of 59 mgd (2570 l/s) if the treatment of 25 mgd (1100 l/s) of advanced primary effluent of the SBIWTP is not provided in the United States.
- To obtain all the permits required by the Mexican authorities in order to facilitate the verification and oversight of compliance with laws related to the treatment structures that are constructed in Mexico.
- To comply with the water quality laws of the United States and of the State of California in order to allow the discharge in the United States of treated effluent that is not utilized in Mexico through the Southbay Ocean Outfall (SBOO), constructed in the United States within the framework of Minute No. 283.
- To provide the pumping, conveyance and secondary treatment in Mexico for a flow of 59 mgd (2570 l/s), as derived from the results of the City of Tijuana Master Plan.
- To have supervision and approval of each phase of the projects resulting from the United States proposal undertaken by the Commission with participation of the appropriate United States and Mexican technical advisors.
- Ownership and disposition of wastewater from Tijuana, Baja California, treated or not treated under this proposal, will remain under the jurisdiction of the Government of Mexico. Likewise, the Government of Mexico will maintain the jurisdiction for disposal of said wastewater in accordance with applicable Mexican laws.

II. CONTRACT SERVICES

Likewise, both Commissioners observed it acceptable to develop the United States proposal to engineer, construct, operate and maintain treatment works in Mexico in conformance with applicable Mexican legislation, under an operating lease contract between the Commission and the service provider of the Mexican facility. The United States Section would make payments to the service provider, subject to the availability of annual appropriations, under the contract, which would be administered by the Mexican Section in accordance with the 1944 Water Treaty. The payments to be made to the service provider would be offset by compensations or credits that reflect an agreed upon percentage of payments received by Mexico through the sale of water treated by the facility. Said compensations or credits would be mutually agreed upon by the two governments through the Commission. In no instance will the service provider be authorized to decide on the fate or use of the Tijuana, Baja California wastewater, treated or untreated. This decision will be made solely by the Government of Mexico. The service provider may propose mechanisms and specific actions to this respect, but, in any case, will require the authorization of the Government of Mexico.

The Government of the United States would provide, subject to the availability of annual appropriation up to a total of $156 million for the implementation of the project. Any costs above this amount will be subject to subsequent Minutes of the Commission.

The contract will at a minimum include the following items:

- Conveyance of the advanced primary effluent from the SBIWTP, located in the United States, to the Mexican facility for secondary treatment, if secondary treatment for the effluent is not provided at a facility located in the United States.
- Treatment to the secondary level at the facility in Mexico, in compliance with applicable water quality laws of the United States, the State of California, and Mexico.
- Return conveyance from the Mexican treatment facility to the United States of any treated effluent that cannot be reused. The effluent may be discharged through the SBOO into the Pacific Ocean in compliance with water quality laws of the United States and the State of California.
- Wastewater treatment capacity that provides secondary treatment for volumes in addition to the capacity of the SBIWTP, for a total capacity of 59 mgd (2570 l/s) if the treatment of 25 mgd (1100 l/s) of the advanced primary effluent of the SBIWTP is not provided in the United States.
- A contract term of 20 years. When the contract terminates, the facilities will be transferred, in good operating conditions, to the responsible Mexican authorities.
- Attainment of permits in order for the Commission to monitor, verify and assure compliance with United States, California, and Mexican water quality standards.
- Arrangements in order for the Commission to assure the proper disposal and use, at a site or sites in Mexico, of sludge produced at the SBIWTP and the Mexican facility.
- Payment by the United States Section, subject to annual availability of appropriations, for the contracted wastewater treatment services, including the necessary processes to attain treatment at a secondary level for a capacity of 59 mgd (2570 l/s), if the treatment of 25 mgd (1100 l/s) of advanced primary effluent is not provided in the United States. The payment will cover all agreed upon costs associated with the development, financing, construction, operation and maintenance of the Mexican facilities, on an annual basis.
- Provisions for non-compliance with the terms of the contract.
- The use of competitive procedures applicable in Mexico in the procurement of all

property and/or services for the engineering, construction, and operation and maintenance of the Mexican facility.

- Oversight of a Binational Technical Committee composed of appropriate United States and Mexican technical advisors, presided over by the Commission, to provide support to the Commission in the supervision of the different phases of the proposed actions included in this and subsequent Minutes. The Technical Committee may include for the United States the State of California and USEPA and for Mexico Comisión Nacional del Agua (CNA) and Government of Baja California.
- Provisions for the Commission, with the support of the Binational Technical Committee, to review and approve the selection of all contractors to perform the engineering, construction, and operation and maintenance for the Mexican facility.
- Ensure the maintenance by the service provider of the Mexican facility of all records (including books, documents, papers, reports, and other materials) pertaining to the operation of the facility necessary to demonstrate compliance with the terms of the contract and those in this Minute.
- Access by the Commission for audit and examination of all records maintained in accordance with the previous item, to facilitate the monitoring and evaluation of the performance of the Mexican facility

The Commissioners noted that the implementation of this Minute would require supervision by the Commission with the support of the Binational Technical Committee that includes the monitoring, on a quarterly basis, of the progress and status on the implementation of any contract executed under this Minute, as well as an evaluation of the extent to which the terms of such contract have been met. They also considered the recommendations that the findings of such observations will be presented, through the respective Section, to domestic agencies requiring such reports, beginning no later than two years after the execution of such a contract and every year after until contract close-out.

III. PREVIOUS CONSULTATIONS

The Commissioners also noted the ongoing discussions convened by the two Sections since January 2001. Meetings of the Commission have taken place and letters have been exchanged within the Commission as well as at the diplomatic level, in which the Government of Mexico has shown interest in the United States proposal and expressed its willingness to further discuss this matter on the basis that the concept is compatible with the option recommended in the City of Tijuana Master Plan, presents opportunities for additional investment in Mexico, includes an arrangement for the disposal of the effluent by means of the SBOO, allows opportunity to realize the existing potential for reuse of the effluent, decreases the pressure on the supply sources by placing the treated effluent closer to the potential sites for potable and non-potable reuse, and involves cooperation between both countries for treatment and disposal of a volume of Tijuana wastewater greater than the present 25 mgd (1100 l/s).

From the various meetings and exchange of letters of the Commission, the following understandings were noted:

1. It would be feasible to incorporate the participation of a public-private service provider for the treatment of wastewater in accordance with applicable regulations in Mexico.
2. The Commission could participate in an operating lease contract for the engineering, construction, operation and maintenance in accordance with Mexican law and in accordance with additional terms to be established in a subsequent Commission Minute.
3. The operating lease contract would be administered consistent with provisions in the 1944 Water Treaty, applicable Mexican laws and in accordance with the terms and conditions established through subsequent Commission Minutes.
4. That the adopted project would be consistent with the solution identified in the Tijuana Master Plan; that it would address infrastructure capacities, land use, land acquisition, type of treatment and disposal of effluent; they would satisfy the requirements of CNA and the State of Baja California; that it would dedicate special attention to odor control; that it would address the selection of the service provider, in accordance with procedures in applicable Mexican laws; and it would define the fate of the facilities when the contract period ends.

IV. IMPLEMENTATION PLAN

The Commissioners noted the legislation set forth by the United States Congress in Public Law 106-457, the conclusions set forth by the Tijuana Master Plan and the discussions held by the Commission were sufficient basis to move ahead in relation to the secondary treatment of the effluent from the SBIWTP and the future flows of Tijuana. Therefore, the Commissioners considered it appropriate to implement the following actions:

1. Once the initial appropriated funds are available, the Commission would develop an operating lease arrangement contract, as defined under Section II of this Minute, "Contract Services," for the financing and development of the engineering, construction, operation and maintenance of the facilities in Mexico. This arrangement will need to have the approval of both governments, expressed in a subsequent Minute.
2. The final design of the facilities to be constructed in Mexico and the final arrangement for its implementation, as well as the terms under which the United States Section will make payments for the design, construction, operation and maintenance of said facilities, will be established in a subsequent Minute of the

Commission. In case that agreement on an operating lease arrangement or design that is acceptable to both governments is not reached, the stipulations established in Commission Minutes Nos. 283 and 296 will apply.

3. At the termination of the contract, the facilities constructed in Mexico will be transferred in adequate operating condition to the responsible Mexican authorities. The terms for subsequent operation will be established in a Commission Minute, and if necessary, the terms for the discharge of the plant effluent.

Based on the above, the Commissioners present the following recommendations for the approval of the two governments:

1. The United States Section shall fund, subject to availability of annual appropriations, up to a total of $156 million for the engineering, construction, and for a period of 20 years the operation and maintenance of a 59 mgd (2570 l/s) secondary wastewater treatment plant in Mexico, if the treatment of 25 mgd (1100 l/s) of advanced primary effluent of the SBIWTP is not provided in the United States. Any additional costs shall be subject to subsequent Commission agreements. The Government of Mexico shall cover the corresponding costs for the first 25 mgd (1100 l/s) as stipulated in Commission Minutes Nos. 283 and 296. Treatment to the secondary treatment level will be in compliance with water quality laws of the United States, the State of California and Mexico.
2. The Commission shall adopt the implementation plan contained in Section IV of this Minute.
3. The Commission, with support from their respective technical advisors, shall review and approve the terms of reference for the selection of a service provider.
4. The Commission shall administer the project guided by the solution identified in the Tijuana Master Plan, to satisfy the requirements of the responsible Mexican authorities and to address infrastructure capacities, land use, land acquisition, type of treatment, odor control, sludge management, and disposal of effluent that cannot be reused in Mexico. The effluent may be discharged through the SBOO into the Pacific Ocean in compliance with water quality laws of the United States and the State of California.
5. The Commission shall supervise the project including quarterly monitoring of progress and status of performance on any contract executed to fulfill the objective of this Minute, and an evaluation of the degree to which the service provider of the facilities in Mexico has complied with the terms of the contract. The results of these observations shall be presented, through the corresponding Section of the Commission, to the authorities which require these reports in each country, beginning no later than two years after execution of the contract referred to in Section II of this Minute, and annually thereafter.

6. All activities undertaken pursuant to the provisions of this Minute shall be subject to the availability of appropriated funds, resources, and corresponding personnel, as well as to applicable laws and regulations in each country.
7. This Minute shall enter into force upon notification of approval by the Government of the United States of America and the Government of the United Mexican States through the respective Sections of the Commission, and shall terminate when the operating lease contract referenced in Paragraph No. 1 of Section IV of this Minute concludes.

The meeting was adjourned.

Arturo Q. Duran
United States Commissioner

J. Arturo Herrera Solís
Mexican Commissioner

Carlos Peña, Jr.
Secretary of the United States Section

Jesús Luévano Grano
Secretary of the Mexican Section

APPENDIX C
PUBLIC LAW 106-457

Public Law 106–457
106th Congress

An Act

To encourage the restoration of estuary habitat through more efficient project financing and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes.

Nov. 7, 2000
[S. 835]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Estuaries and Clean Waters Act of 2000.

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Estuaries and Clean Waters Act of 2000".

33 USC 2901 note.

(b) TABLE OF CONTENTS.—

TITLE I—ESTUARY RESTORATION

Estuary Restoration Act of 2000.
33 USC 2901 note.

SEC. 101. SHORT TITLE.

This title may be cited as the "Estuary Restoration Act of 2000".

33 USC 2901.

SEC. 102. PURPOSES.

The purposes of this title are—

(1) to promote the restoration of estuary habitat;

(2) to develop a national estuary habitat restoration strategy for creating and maintaining effective estuary habitat restoration partnerships among public agencies at all levels of government and to establish new partnerships between the public and private sectors;

(3) to provide Federal assistance for estuary habitat restoration projects and to promote efficient financing of such projects; and

(4) to develop and enhance monitoring and research capabilities through the use of the environmental technology innovation program associated with the National Estuarine Research Reserve System established by section 315 of the Coastal Zone Management Act of 1972 (16 U.S.C. 1461) to ensure that estuary habitat restoration efforts are based on sound scientific understanding and innovative technologies.

33 USC 2902.

SEC. 103. DEFINITIONS.

In this title, the following definitions apply:

(1) COUNCIL.—The term "Council" means the Estuary Habitat Restoration Council established by section 105.

(2) ESTUARY.—The term "estuary" means a part of a river or stream or other body of water that has an unimpaired connection with the open sea and where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes near coastal waters and wetlands of the Great Lakes that are similar in form and function to estuaries, including the area located in the Great Lakes biogeographic region and designated as a National Estuarine Research Reserve under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) as of the date of enactment of this Act.

(3) ESTUARY HABITAT.—The term "estuary habitat" means the physical, biological, and chemical elements associated with an estuary, including the complex of physical and hydrologic features and living organisms within the estuary and associated ecosystems.

(4) ESTUARY HABITAT RESTORATION ACTIVITY.—

(A) IN GENERAL.—The term "estuary habitat restoration activity" means an activity that results in improving degraded estuaries or estuary habitat or creating estuary habitat (including both physical and functional restoration), with the goal of attaining a self-sustaining system integrated into the surrounding landscape.

(B) INCLUDED ACTIVITIES.—The term "estuary habitat restoration activity" includes—

(i) the reestablishment of chemical, physical, hydrologic, and biological features and components associated with an estuary;

(ii) except as provided in subparagraph (C), the cleanup of pollution for the benefit of estuary habitat;

(iii) the control of nonnative and invasive species in the estuary;

(iv) the reintroduction of species native to the estuary, including through such means as planting or promoting natural succession;

(v) the construction of reefs to promote fish and shellfish production and to provide estuary habitat for living resources; and

(vi) other activities that improve estuary habitat.

(C) EXCLUDED ACTIVITIES.—The term "estuary habitat restoration activity" does not include an activity that—

(i) constitutes mitigation required under any Federal or State law for the adverse effects of an activity regulated or otherwise governed by Federal or State law; or

(ii) constitutes restoration for natural resource damages required under any Federal or State law.

(5) ESTUARY HABITAT RESTORATION PROJECT.—The term "estuary habitat restoration project" means a project to carry out an estuary habitat restoration activity.

(6) ESTUARY HABITAT RESTORATION PLAN.—

(A) IN GENERAL.—The term "estuary habitat restoration plan" means any Federal or State plan for restoration of degraded estuary habitat that was developed with the substantial participation of appropriate public and private stakeholders.

(B) INCLUDED PLANS AND PROGRAMS.—The term "estuary habitat restoration plan" includes estuary habitat restoration components of—

(i) a comprehensive conservation and management plan approved under section 320 of the Federal Water Pollution Control Act (33 U.S.C. 1330);

(ii) a lakewide management plan or remedial action plan developed under section 118 of the Federal Water Pollution Control Act (33 U.S.C. 1268);

(iii) a management plan approved under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.); and

(iv) the interstate management plan developed pursuant to the Chesapeake Bay program under section 117 of the Federal Water Pollution Control Act (33 U.S.C. 1267).

(7) INDIAN TRIBE.—The term "Indian tribe" has the meaning given such term by section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(8) NON-FEDERAL INTEREST.—The term "non-Federal interest" means a State, a political subdivision of a State, an Indian tribe, a regional or interstate agency, or, as provided in section 104(f)(2), a nongovernmental organization.

(9) SECRETARY.—The term "Secretary" means the Secretary of the Army.

(10) STATE.—The term "State" means the States of Alabama, Alaska, California, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Virginia, Washington, and Wisconsin, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the United States Virgin Islands, American Samoa, and Guam.

33 USC 2903.

SEC. 104. ESTUARY HABITAT RESTORATION PROGRAM.

(a) ESTABLISHMENT.—There is established an estuary habitat restoration program under which the Secretary may carry out estuary habitat restoration projects and provide technical assistance in accordance with the requirements of this title.

(b) ORIGIN OF PROJECTS.—A proposed estuary habitat restoration project shall originate from a non-Federal interest consistent with State or local laws.

(c) SELECTION OF PROJECTS.—

(1) IN GENERAL.—The Secretary shall select estuary habitat restoration projects from a list of project proposals submitted by the Estuary Habitat Restoration Council under section 105(b).

(2) REQUIRED ELEMENTS.—Each estuary habitat restoration project selected by the Secretary must—

(A) address restoration needs identified in an estuary habitat restoration plan;

(B) be consistent with the estuary habitat restoration strategy developed under section 106;

(C) include a monitoring plan that is consistent with standards for monitoring developed under section 107 to ensure that short-term and long-term restoration goals are achieved; and

(D) include satisfactory assurance from the non-Federal interests proposing the project that the non-Federal interests will have adequate personnel, funding, and authority to carry out items of local cooperation and properly maintain the project.

(3) FACTORS FOR SELECTION OF PROJECTS.—In selecting an estuary habitat restoration project, the Secretary shall consider the following factors:

(A) Whether the project is part of an approved Federal estuary management or habitat restoration plan.

(B) The technical feasibility of the project.

(C) The scientific merit of the project.

(D) Whether the project will encourage increased coordination and cooperation among Federal, State, and local government agencies.

(E) Whether the project fosters public-private partnerships and uses Federal resources to encourage increased private sector involvement, including consideration of the amount of private funds or in-kind contributions for an estuary habitat restoration activity.

(F) Whether the project is cost-effective.

(G) Whether the State in which the non-Federal interest is proposing the project has a dedicated source of funding to acquire or restore estuary habitat, natural areas, and open spaces for the benefit of estuary habitat restoration or protection.

(H) Other factors that the Secretary determines to be reasonable and necessary for consideration.

(4) PRIORITY.—In selecting estuary habitat restoration projects to be carried out under this title, the Secretary shall give priority consideration to a project if, in addition to meriting selection based on the factors under paragraph (3)—

(A) the project occurs within a watershed in which there is a program being carried out that addresses sources of pollution and other activities that otherwise would re-impair the restored habitat; or

(B) the project includes pilot testing of or a demonstration of an innovative technology having the potential for improved cost-effectiveness in estuary habitat restoration.

(d) COST SHARING.—

(1) FEDERAL SHARE.—Except as provided in paragraph (2) and subsection (e)(2), the Federal share of the cost of an estuary habitat restoration project (other than the cost of operation and maintenance of the project) carried out under this title shall not exceed 65 percent of such cost.

(2) INNOVATIVE TECHNOLOGY COSTS.—The Federal share of the incremental additional cost of including in a project pilot testing of or a demonstration of an innovative technology described in subsection (c)(4)(B) shall be 85 percent.

(3) NON-FEDERAL SHARE.—The non-Federal share of the cost of an estuary habitat restoration project carried out under this title shall include lands, easements, rights-of-way, and relocations and may include services, or any other form of in-kind contribution determined by the Secretary to be an appropriate contribution equivalent to the monetary amount required for the non-Federal share of the activity.

(4) OPERATION AND MAINTENANCE.—The non-Federal interests shall be responsible for all costs associated with operating, maintaining, replacing, repairing, and rehabilitating all projects carried out under this section.

(e) INTERIM ACTIONS.—

(1) IN GENERAL.—Pending completion of the estuary habitat restoration strategy to be developed under section 106, the Secretary may take interim actions to carry out an estuary habitat restoration activity.

(2) FEDERAL SHARE.—The Federal share of the cost of an estuary habitat restoration activity before the completion of the estuary habitat restoration strategy shall not exceed 25 percent of such cost.

(f) COOPERATION OF NON-FEDERAL INTERESTS.—

(1) IN GENERAL.—The Secretary may not carry out an estuary habitat restoration project until a non-Federal interest has entered into a written agreement with the Secretary in which the non-Federal interest agrees to—

(A) provide all lands, easements, rights-of-way, and relocations and any other elements the Secretary determines appropriate under subsection (d)(3); and

(B) provide for maintenance and monitoring of the project.

(2) NONGOVERNMENTAL ORGANIZATIONS.—Notwithstanding section 221(b) of the Flood Control Act of 1970 (42 U.S.C. 1962d–5b(b)), for any project to be undertaken under this title, the Secretary, in consultation and coordination with appropriate State and local governmental agencies and Indian tribes, may allow a nongovernmental organization to serve as the non-Federal interest for the project.

(g) DELEGATION OF PROJECT IMPLEMENTATION.—In carrying out this title, the Secretary may delegate project implementation to another Federal department or agency on a reimbursable basis if the Secretary, upon the recommendation of the Council, determines such delegation is appropriate.

33 USC 2904.

SEC. 105. ESTABLISHMENT OF ESTUARY HABITAT RESTORATION COUNCIL.

(a) COUNCIL.—There is established a council to be known as the "Estuary Habitat Restoration Council".

(b) DUTIES.—The Council shall be responsible for—

(1) soliciting, reviewing, and evaluating project proposals and developing recommendations concerning such proposals based on the factors specified in section 104(c)(3);

(2) submitting to the Secretary a list of recommended projects, including a recommended priority order and any recommendation as to whether a project should be carried out by the Secretary or by another Federal department or agency under section 104(g);

(3) developing and transmitting to Congress a national strategy for restoration of estuary habitat;

(4) periodically reviewing the effectiveness of the national strategy in meeting the purposes of this title and, as necessary, updating the national strategy; and

(5) providing advice on the development of the database, monitoring standards, and report required under sections 107 and 108.

(c) MEMBERSHIP.—The Council shall be composed of the following members:

(1) The Secretary (or the Secretary's designee).

(2) The Under Secretary for Oceans and Atmosphere of the Department of Commerce (or the Under Secretary's designee).

(3) The Administrator of the Environmental Protection Agency (or the Administrator's designee).

(4) The Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service (or such Secretary's designee).

(5) The Secretary of Agriculture (or such Secretary's designee).

(6) The head of any other Federal agency designated by the President to serve as an ex officio member of the Council.

(d) PROHIBITION OF COMPENSATION.—Members of the Council may not receive compensation for their service as members of the Council.

(e) CHAIRPERSON.—The chairperson shall be elected by the Council from among its members for a 3-year term, except that the first elected chairperson may serve a term of fewer than 3 years.

(f) CONVENING OF COUNCIL.—

(1) FIRST MEETING.—The Secretary shall convene the first meeting of the Council not later than 60 days after the date of enactment of this Act for the purpose of electing a chairperson. Deadline.

(2) ADDITIONAL MEETINGS.—The chairperson shall convene additional meetings of the Council as often as appropriate to ensure that this title is fully carried out, but not less often than annually.

(g) COUNCIL PROCEDURES.—The Council shall establish procedures for voting, the conduct of meetings, and other matters, as necessary.

(h) PUBLIC PARTICIPATION.—Meetings of the Council shall be open to the public. The Council shall provide notice to the public of such meetings.

(i) ADVICE.—The Council shall consult with persons with recognized scientific expertise in estuary or estuary habitat restoration, representatives of State agencies, local or regional government agencies, and nongovernmental organizations with expertise in estuary or estuary habitat restoration, and representatives of Indian tribes, agricultural interests, fishing interests, and other estuary users—

(1) to assist the Council in the development of the estuary habitat restoration strategy to be developed under section 106; and

(2) to provide advice and recommendations to the Council on proposed estuary habitat restoration projects, including advice on the scientific merit, technical merit, and feasibility of a project.

SEC. 106. ESTUARY HABITAT RESTORATION STRATEGY. 33 USC 2905.

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Council, shall develop an estuary habitat restoration strategy designed to ensure a comprehensive approach to maximize benefits derived from estuary habitat restoration projects and to foster the coordination of Federal and non-Federal activities related to restoration of estuary habitat. Deadline.

(b) GOAL.—The goal of the strategy shall be the restoration of 1,000,000 acres of estuary habitat by the year 2010.

(c) INTEGRATION OF ESTUARY HABITAT RESTORATION PLANS, PROGRAMS, AND PARTNERSHIPS.—In developing the estuary habitat restoration strategy, the Council shall—

(1) conduct a review of estuary management or habitat restoration plans and Federal programs established under other laws that authorize funding for estuary habitat restoration activities; and

(2) ensure that the estuary habitat restoration strategy is developed in a manner that is consistent with the estuary management or habitat restoration plans.

(d) ELEMENTS OF THE STRATEGY.—The estuary habitat restoration strategy shall include proposals, methods, and guidance on—

(1) maximizing the incentives for the creation of new public-private partnerships to carry out estuary habitat restoration projects and the use of Federal resources to encourage increased private sector involvement in estuary habitat restoration activities;

(2) ensuring that the estuary habitat restoration strategy will be implemented in a manner that is consistent with the estuary management or habitat restoration plans;

(3) promoting estuary habitat restoration projects to—

(A) provide healthy ecosystems in order to support—

(i) wildlife, including endangered and threatened species, migratory birds, and resident species of an estuary watershed; and

(ii) fish and shellfish, including commercial and recreational fisheries;

(B) improve surface and ground water quality and quantity, and flood control;

(C) provide outdoor recreation; and

(D) address other areas of concern that the Council determines to be appropriate for consideration;

(4) addressing the estimated historic losses, estimated current rate of loss, and extent of the threat of future loss or degradation of each type of estuary habitat;

(5) measuring the rate of change for each type of estuary habitat;

(6) selecting a balance of smaller and larger estuary habitat restoration projects; and

(7) ensuring equitable geographic distribution of projects funded under this title.

Federal Register, publication.

(e) PUBLIC REVIEW AND COMMENT.—Before the Council adopts a final or revised estuary habitat restoration strategy, the Secretary shall publish in the Federal Register a draft of the estuary habitat restoration strategy and provide an opportunity for public review and comment.

(f) PERIODIC REVISION.—Using data and information developed through project monitoring and management, and other relevant information, the Council may periodically review and update, as necessary, the estuary habitat restoration strategy.

33 USC 2906.

SEC. 107. MONITORING OF ESTUARY HABITAT RESTORATION PROJECTS.

(a) UNDER SECRETARY.—In this section, the term "Under Secretary" means the Under Secretary for Oceans and Atmosphere of the Department of Commerce.

(b) DATABASE OF RESTORATION PROJECT INFORMATION.—The Under Secretary, in consultation with the Council, shall develop and maintain an appropriate database of information concerning estuary habitat restoration projects carried out under this title, including information on project techniques, project completion, monitoring data, and other relevant information.

(c) MONITORING DATA STANDARDS.—The Under Secretary, in consultation with the Council, shall develop standard data formats for monitoring projects, along with requirements for types of data collected and frequency of monitoring.

(d) COORDINATION OF DATA.—The Under Secretary shall compile information that pertains to estuary habitat restoration projects from other Federal, State, and local sources and that meets the quality control requirements and data standards established under this section.

(e) USE OF EXISTING PROGRAMS.—The Under Secretary shall use existing programs within the National Oceanic and Atmospheric Administration to create and maintain the database required under this section.

(f) PUBLIC AVAILABILITY.—The Under Secretary shall make the information collected and maintained under this section available to the public.

SEC. 108. REPORTING. 33 USC 2907.

(a) IN GENERAL.—At the end of the third and fifth fiscal years following the date of enactment of this Act, the Secretary, after considering the advice and recommendations of the Council, shall transmit to Congress a report on the results of activities carried out under this title.

(b) CONTENTS OF REPORT.—A report under subsection (a) shall include—

(1) data on the number of acres of estuary habitat restored under this title, including descriptions of, and partners involved with, projects selected, in progress, and completed under this title that comprise those acres;

(2) information from the database established under section 107(b) related to ongoing monitoring of projects to ensure that short-term and long-term restoration goals are achieved;

(3) an estimate of the long-term success of varying restoration techniques used in carrying out estuary habitat restoration projects;

(4) a review of how the information described in paragraphs (1) through (3) has been incorporated in the selection and implementation of estuary habitat restoration projects;

(5) a review of efforts made to maintain an appropriate database of restoration projects carried out under this title; and

(6) a review of the measures taken to provide the information described in paragraphs (1) through (3) to persons with responsibility for assisting in the restoration of estuary habitat.

SEC. 109. FUNDING. 33 USC 2908.

(a) AUTHORIZATION OF APPROPRIATIONS.—

(1) ESTUARY HABITAT RESTORATION PROJECTS.—There is authorized to be appropriated to the Secretary for carrying out and providing technical assistance for estuary habitat restoration projects—

(A) $40,000,000 for fiscal year 2001;

(B) $50,000,000 for each of fiscal years 2002 and 2003;

(C) $60,000,000 for fiscal year 2004; and

(D) $75,000,000 for fiscal year 2005.

Such sums shall remain available until expended.

(2) MONITORING.—There is authorized to be appropriated to the Under Secretary for Oceans and Atmosphere of the Department of Commerce for the acquisition, maintenance, and management of monitoring data on restoration projects carried out under this title, $1,500,000 for each of fiscal years 2001 through 2005. Such sums shall remain available until expended.

(b) SET-ASIDE FOR ADMINISTRATIVE EXPENSES OF THE COUNCIL.—Not to exceed 3 percent of the amounts appropriated for a fiscal year under subsection (a)(1) or $1,500,000, whichever is greater, may be used by the Secretary for administration and operation of the Council.

33 USC 2909.

SEC. 110. GENERAL PROVISIONS.

(a) AGENCY CONSULTATION AND COORDINATION.—In carrying out this title, the Secretary shall, as necessary, consult with, cooperate with, and coordinate its activities with the activities of other Federal departments and agencies.

(b) COOPERATIVE AGREEMENTS; MEMORANDA OF UNDERSTANDING.—In carrying out this title, the Secretary may—

(1) enter into cooperative agreements with Federal, State, and local government agencies and other entities; and

(2) execute such memoranda of understanding as are necessary to reflect the agreements.

(c) FEDERAL AGENCY FACILITIES AND PERSONNEL.—Federal agencies may cooperate in carrying out scientific and other programs necessary to carry out this title, and may provide facilities and personnel, for the purpose of assisting the Council in carrying out its duties under this title.

(d) IDENTIFICATION AND MAPPING OF DREDGED MATERIAL DISPOSAL SITES.—In consultation with appropriate Federal and non-Federal public entities, the Secretary shall undertake, and update as warranted by changed conditions, surveys to identify and map sites appropriate for beneficial uses of dredged material for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in order to further the purposes of this title.

(e) STUDY OF BIOREMEDIATION TECHNOLOGY.—

Deadline.

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator of the Environmental Protection Agency, with the participation of the estuarine scientific community, shall begin a 2-year study on the efficacy of bioremediation products.

(2) REQUIREMENTS.—The study shall—

(A) evaluate and assess bioremediation technology—

(i) on low-level petroleum hydrocarbon contamination from recreational boat bilges;

(ii) on low-level petroleum hydrocarbon contamination from stormwater discharges;

(iii) on nonpoint petroleum hydrocarbon discharges; and

(iv) as a first response tool for petroleum hydrocarbon spills; and

(B) recommend management actions to optimize the return of a healthy and balanced ecosystem and make improvements in the quality and character of estuarine waters.

TITLE II—CHESAPEAKE BAY RESTORATION

Chesapeake Bay Restoration Act of 2000. State listing. 33 USC 1251 note.

SEC. 201. SHORT TITLE.

This title may be cited as the "Chesapeake Bay Restoration Act of 2000".

SEC. 202. FINDINGS AND PURPOSES.

33 USC 1267 note.

(a) FINDINGS.—Congress finds that—

(1) the Chesapeake Bay is a national treasure and a resource of worldwide significance;

(2) over many years, the productivity and water quality of the Chesapeake Bay and its watershed were diminished by pollution, excessive sedimentation, shoreline erosion, the impacts of population growth and development in the Chesapeake Bay watershed, and other factors;

(3) the Federal Government (acting through the Administrator of the Environmental Protection Agency), the Governor of the State of Maryland, the Governor of the Commonwealth of Virginia, the Governor of the Commonwealth of Pennsylvania, the Chairperson of the Chesapeake Bay Commission, and the mayor of the District of Columbia, as Chesapeake Bay Agreement signatories, have committed to a comprehensive cooperative program to achieve improved water quality and improvements in the productivity of living resources of the Bay;

(4) the cooperative program described in paragraph (3) serves as a national and international model for the management of estuaries; and

(5) there is a need to expand Federal support for monitoring, management, and restoration activities in the Chesapeake Bay and the tributaries of the Bay in order to meet and further the original and subsequent goals and commitments of the Chesapeake Bay Program.

(b) PURPOSES.—The purposes of this title are—

(1) to expand and strengthen cooperative efforts to restore and protect the Chesapeake Bay; and

(2) to achieve the goals established in the Chesapeake Bay Agreement.

SEC. 203. CHESAPEAKE BAY.

Section 117 of the Federal Water Pollution Control Act (33 U.S.C. 1267) is amended to read as follows:

"SEC. 117. CHESAPEAKE BAY.

"(a) DEFINITIONS.—In this section, the following definitions apply:

"(1) ADMINISTRATIVE COST.—The term 'administrative cost' means the cost of salaries and fringe benefits incurred in administering a grant under this section.

"(2) CHESAPEAKE BAY AGREEMENT.—The term 'Chesapeake Bay Agreement' means the formal, voluntary agreements executed to achieve the goal of restoring and protecting the Chesapeake Bay ecosystem and the living resources of the Chesapeake Bay ecosystem and signed by the Chesapeake Executive Council.

"(3) CHESAPEAKE BAY ECOSYSTEM.—The term 'Chesapeake Bay ecosystem' means the ecosystem of the Chesapeake Bay and its watershed.

"(4) CHESAPEAKE BAY PROGRAM.—The term 'Chesapeake Bay Program' means the program directed by the Chesapeake Executive Council in accordance with the Chesapeake Bay Agreement.

"(5) CHESAPEAKE EXECUTIVE COUNCIL.—The term 'Chesapeake Executive Council' means the signatories to the Chesapeake Bay Agreement.

"(6) SIGNATORY JURISDICTION.—The term 'signatory jurisdiction' means a jurisdiction of a signatory to the Chesapeake Bay Agreement.

"(b) CONTINUATION OF CHESAPEAKE BAY PROGRAM.—

"(1) IN GENERAL.—In cooperation with the Chesapeake Executive Council (and as a member of the Council), the Administrator shall continue the Chesapeake Bay Program.

"(2) PROGRAM OFFICE.—

Government organization.

"(A) IN GENERAL.—The Administrator shall maintain in the Environmental Protection Agency a Chesapeake Bay Program Office.

"(B) FUNCTION.—The Chesapeake Bay Program Office shall provide support to the Chesapeake Executive Council by—

"(i) implementing and coordinating science, research, modeling, support services, monitoring, data collection, and other activities that support the Chesapeake Bay Program;

"(ii) developing and making available, through publications, technical assistance, and other appropriate means, information pertaining to the environmental quality and living resources of the Chesapeake Bay ecosystem;

"(iii) in cooperation with appropriate Federal, State, and local authorities, assisting the signatories to the Chesapeake Bay Agreement in developing and implementing specific action plans to carry out the responsibilities of the signatories to the Chesapeake Bay Agreement;

"(iv) coordinating the actions of the Environmental Protection Agency with the actions of the appropriate officials of other Federal agencies and State and local authorities in developing strategies to—

"(I) improve the water quality and living resources in the Chesapeake Bay ecosystem; and

"(II) obtain the support of the appropriate officials of the agencies and authorities in achieving the objectives of the Chesapeake Bay Agreement; and

"(v) implementing outreach programs for public information, education, and participation to foster stewardship of the resources of the Chesapeake Bay.

"(c) INTERAGENCY AGREEMENTS.—The Administrator may enter into an interagency agreement with a Federal agency to carry out this section.

"(d) TECHNICAL ASSISTANCE AND ASSISTANCE GRANTS.—

"(1) IN GENERAL.—In cooperation with the Chesapeake Executive Council, the Administrator may provide technical assistance, and assistance grants, to nonprofit organizations, State and local governments, colleges, universities, and interstate agencies to carry out this section, subject to such terms and conditions as the Administrator considers appropriate.

"(2) FEDERAL SHARE.—

"(A) IN GENERAL.—Except as provided in subparagraph (B), the Federal share of an assistance grant provided under paragraph (1) shall be determined by the Administrator in accordance with guidance issued by the Administrator.

"(B) SMALL WATERSHED GRANTS PROGRAM.—The Federal share of an assistance grant provided under paragraph (1) to carry out an implementing activity under subsection (g)(2) shall not exceed 75 percent of eligible project costs, as determined by the Administrator.

"(3) NON-FEDERAL SHARE.—An assistance grant under paragraph (1) shall be provided on the condition that non-Federal sources provide the remainder of eligible project costs, as determined by the Administrator.

"(4) ADMINISTRATIVE COSTS.—Administrative costs shall not exceed 10 percent of the annual grant award.

"(e) IMPLEMENTATION AND MONITORING GRANTS.—

"(1) IN GENERAL.—If a signatory jurisdiction has approved and committed to implement all or substantially all aspects of the Chesapeake Bay Agreement, on the request of the chief executive of the jurisdiction, the Administrator—

"(A) shall make a grant to the jurisdiction for the purpose of implementing the management mechanisms established under the Chesapeake Bay Agreement, subject to such terms and conditions as the Administrator considers appropriate; and

"(B) may make a grant to a signatory jurisdiction for the purpose of monitoring the Chesapeake Bay ecosystem.

"(2) PROPOSALS.—

"(A) IN GENERAL.—A signatory jurisdiction described in paragraph (1) may apply for a grant under this subsection for a fiscal year by submitting to the Administrator a comprehensive proposal to implement management mechanisms established under the Chesapeake Bay Agreement.

"(B) CONTENTS.—A proposal under subparagraph (A) shall include—

"(i) a description of proposed management mechanisms that the jurisdiction commits to take within a specified time period, such as reducing or preventing pollution in the Chesapeake Bay and its watershed or meeting applicable water quality standards or established goals and objectives under the Chesapeake Bay Agreement; and

"(ii) the estimated cost of the actions proposed to be taken during the fiscal year.

"(3) APPROVAL.—If the Administrator finds that the proposal is consistent with the Chesapeake Bay Agreement and the national goals established under section 101(a), the Administrator may approve the proposal for an award.

"(4) FEDERAL SHARE.—The Federal share of a grant under this subsection shall not exceed 50 percent of the cost of implementing the management mechanisms during the fiscal year.

"(5) NON-FEDERAL SHARE.—A grant under this subsection shall be made on the condition that non-Federal sources provide the remainder of the costs of implementing the management mechanisms during the fiscal year.

"(6) ADMINISTRATIVE COSTS.—Administrative costs shall not exceed 10 percent of the annual grant award.

Deadline. Public information.

"(7) REPORTING.—On or before October 1 of each fiscal year, the Administrator shall make available to the public a document that lists and describes, in the greatest practicable degree of detail—

"(A) all projects and activities funded for the fiscal year;

"(B) the goals and objectives of projects funded for the previous fiscal year; and

"(C) the net benefits of projects funded for previous fiscal years.

"(f) FEDERAL FACILITIES AND BUDGET COORDINATION.—

"(1) SUBWATERSHED PLANNING AND RESTORATION.—A Federal agency that owns or operates a facility (as defined by the Administrator) within the Chesapeake Bay watershed shall participate in regional and subwatershed planning and restoration programs.

"(2) COMPLIANCE WITH AGREEMENT.—The head of each Federal agency that owns or occupies real property in the Chesapeake Bay watershed shall ensure that the property, and actions taken by the agency with respect to the property, comply with the Chesapeake Bay Agreement, the Federal Agencies Chesapeake Ecosystem Unified Plan, and any subsequent agreements and plans.

"(3) BUDGET COORDINATION.—

"(A) IN GENERAL.—As part of the annual budget submission of each Federal agency with projects or grants related to restoration, planning, monitoring, or scientific investigation of the Chesapeake Bay ecosystem, the head of the agency shall submit to the President a report that describes plans for the expenditure of the funds under this section.

"(B) DISCLOSURE TO THE COUNCIL.—The head of each agency referred to in subparagraph (A) shall disclose the report under that subparagraph with the Chesapeake Executive Council as appropriate.

"(g) CHESAPEAKE BAY PROGRAM.—

"(1) MANAGEMENT STRATEGIES.—The Administrator, in coordination with other members of the Chesapeake Executive Council, shall ensure that management plans are developed and implementation is begun by signatories to the Chesapeake Bay Agreement to achieve and maintain—

"(A) the nutrient goals of the Chesapeake Bay Agreement for the quantity of nitrogen and phosphorus entering the Chesapeake Bay and its watershed;

"(B) the water quality requirements necessary to restore living resources in the Chesapeake Bay ecosystem;

"(C) the Chesapeake Bay Basinwide Toxins Reduction and Prevention Strategy goal of reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources of the Chesapeake Bay ecosystem or on human health;

"(D) habitat restoration, protection, creation, and enhancement goals established by Chesapeake Bay Agreement signatories for wetlands, riparian forests, and other types of habitat associated with the Chesapeake Bay ecosystem; and

"(E) the restoration, protection, creation, and enhancement goals established by the Chesapeake Bay Agreement signatories for living resources associated with the Chesapeake Bay ecosystem.

"(2) SMALL WATERSHED GRANTS PROGRAM.—The Administrator, in cooperation with the Chesapeake Executive Council, shall—

"(A) establish a small watershed grants program as part of the Chesapeake Bay Program; and

"(B) offer technical assistance and assistance grants under subsection (d) to local governments and nonprofit organizations and individuals in the Chesapeake Bay region to implement—

"(i) cooperative tributary basin strategies that address the water quality and living resource needs in the Chesapeake Bay ecosystem; and

"(ii) locally based protection and restoration programs or projects within a watershed that complement the tributary basin strategies, including the creation, restoration, protection, or enhancement of habitat associated with the Chesapeake Bay ecosystem.

"(h) STUDY OF CHESAPEAKE BAY PROGRAM.—

"(1) IN GENERAL.—Not later than April 22, 2003, and every 5 years thereafter, the Administrator, in coordination with the Chesapeake Executive Council, shall complete a study and submit to Congress a comprehensive report on the results of the study. Deadline.

"(2) REQUIREMENTS.—The study and report shall—

"(A) assess the state of the Chesapeake Bay ecosystem;

"(B) compare the current state of the Chesapeake Bay ecosystem with its state in 1975, 1985, and 1995;

"(C) assess the effectiveness of management strategies being implemented on the date of enactment of this section and the extent to which the priority needs are being met;

"(D) make recommendations for the improved management of the Chesapeake Bay Program either by strengthening strategies being implemented on the date of enactment of this section or by adopting new strategies; and

"(E) be presented in such a format as to be readily transferable to and usable by other watershed restoration programs.

"(i) SPECIAL STUDY OF LIVING RESOURCE RESPONSE.—

"(1) IN GENERAL.—Not later than 180 days after the date of enactment of this section, the Administrator shall commence a 5-year special study with full participation of the scientific community of the Chesapeake Bay to establish and expand understanding of the response of the living resources of the Chesapeake Bay ecosystem to improvements in water quality Deadline.

that have resulted from investments made through the Chesapeake Bay Program.

"(2) REQUIREMENTS.—The study shall—

"(A) determine the current status and trends of living resources, including grasses, benthos, phytoplankton, zooplankton, fish, and shellfish;

"(B) establish to the extent practicable the rates of recovery of the living resources in response to improved water quality condition;

"(C) evaluate and assess interactions of species, with particular attention to the impact of changes within and among trophic levels; and

"(D) recommend management actions to optimize the return of a healthy and balanced ecosystem in response to improvements in the quality and character of the waters of the Chesapeake Bay.

"(j) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $40,000,000 for each of fiscal years 2001 through 2005. Such sums shall remain available until expended.".

TITLE III—NATIONAL ESTUARY PROGRAM.

SEC. 301. ADDITION TO NATIONAL ESTUARY PROGRAM.

Section 320(a)(2)(B) of the Federal Water Pollution Control Act (33 U.S.C. 1330(a)(2)(B)) is amended by inserting "Lake Pontchartrain Basin, Louisiana and Mississippi;" before "and Peconic Bay, New York.".

SEC. 302. GRANTS.

Section 320(g) of the Federal Water Pollution Control Act (33 U.S.C. 1330(g)) is amended by striking paragraphs (2) and (3) and inserting the following:

"(2) PURPOSES.—Grants under this subsection shall be made to pay for activities necessary for the development and implementation of a comprehensive conservation and management plan under this section.

"(3) FEDERAL SHARE.—The Federal share of a grant to any person (including a State, interstate, or regional agency or entity) under this subsection for a fiscal year—

"(A) shall not exceed—

"(i) 75 percent of the annual aggregate costs of the development of a comprehensive conservation and management plan; and

"(ii) 50 percent of the annual aggregate costs of the implementation of the plan; and

"(B) shall be made on condition that the non-Federal share of the costs are provided from non-Federal sources.".

SEC. 303. AUTHORIZATION OF APPROPRIATIONS.

Section 320(i) of the Federal Water Pollution Control Act (33 U.S.C. 1330(i)) is amended by striking "$12,000,000 per fiscal year for each of fiscal years 1987, 1988, 1989, 1990, and 1991" and inserting "$35,000,000 for each of fiscal years 2001 through 2005".

TITLE IV—LONG ISLAND SOUND RESTORATION

Long Island Sound Restoration Act. 33 USC 1251 note.

SEC. 401. SHORT TITLE.

This title may be cited as the "Long Island Sound Restoration Act".

SEC. 402. INNOVATIVE METHODOLOGIES AND TECHNOLOGIES.

Section 119(c)(1) of the Federal Water Pollution Control Act (33 U.S.C. 1269(c)(1)) is amended by inserting ", including efforts to establish, within the process for granting watershed general permits, a system for promoting innovative methodologies and technologies that are cost-effective and consistent with the goals of the Plan" before the semicolon at the end.

SEC. 403. ASSISTANCE FOR DISTRESSED COMMUNITIES.

Section 119 of the Federal Water Pollution Control Act (33 U.S.C. 1269) is amended—

(1) by redesignating subsection (e) as subsection (f); and

(2) by inserting after subsection (d) the following:

"(e) ASSISTANCE TO DISTRESSED COMMUNITIES.—

"(1) ELIGIBLE COMMUNITIES.—For the purposes of this subsection, a distressed community is any community that meets affordability criteria established by the State in which the community is located, if such criteria are developed after public review and comment.

"(2) PRIORITY.—In making assistance available under this section for the upgrading of wastewater treatment facilities, the Administrator may give priority to a distressed community.".

SEC. 404. AUTHORIZATION OF APPROPRIATIONS.

Section 119(f) of the Federal Water Pollution Control Act (as redesignated by section 403 of this Act) is amended—

(1) in paragraph (1) by striking "1991 through 2001" and inserting "2001 through 2005"; and

(2) in paragraph (2) by striking "not to exceed $3,000,000 for each of the fiscal years 1991 through 2001" and inserting "not to exceed $40,000,000 for each of fiscal years 2001 through 2005".

TITLE V—LAKE PONTCHARTRAIN BASIN RESTORATION

Lake Pontchartrain Basin Restoration Act of 2000.

SEC. 501. SHORT TITLE.

This title may be cited as the "Lake Pontchartrain Basin Restoration Act of 2000".

SEC. 502. LAKE PONTCHARTRAIN BASIN.

Title I of the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) is amended by adding at the end the following:

33 USC 1273.

"SEC. 121. LAKE PONTCHARTRAIN BASIN.

"(a) ESTABLISHMENT OF RESTORATION PROGRAM.—The Administrator shall establish within the Environmental Protection Agency the Lake Pontchartrain Basin Restoration Program.

"(b) PURPOSE.—The purpose of the program shall be to restore the ecological health of the Basin by developing and funding restoration projects and related scientific and public education projects.

"(c) DUTIES.—In carrying out the program, the Administrator shall—

"(1) provide administrative and technical assistance to a management conference convened for the Basin under section 320;

"(2) assist and support the activities of the management conference, including the implementation of recommendations of the management conference;

"(3) support environmental monitoring of the Basin and research to provide necessary technical and scientific information;

"(4) develop a comprehensive research plan to address the technical needs of the program;

"(5) coordinate the grant, research, and planning programs authorized under this section; and

Public information.

"(6) collect and make available to the public publications, and other forms of information the management conference determines to be appropriate, relating to the environmental quality of the Basin.

"(d) GRANTS.—The Administrator may make grants—

"(1) for restoration projects and studies recommended by a management conference convened for the Basin under section 320; and

"(2) for public education projects recommended by the management conference.

"(e) DEFINITIONS.—In this section, the following definitions apply:

"(1) BASIN.—The term 'Basin' means the Lake Pontchartrain Basin, a 5,000 square mile watershed encompassing 16 parishes in the State of Louisiana and 4 counties in the State of Mississippi.

"(2) PROGRAM.—The term 'program' means the Lake Pontchartrain Basin Restoration Program established under subsection (a).

"(f) AUTHORIZATION OF APPROPRIATIONS.—

"(1) IN GENERAL.—There is authorized to be appropriated to carry out this section $20,000,000 for each of fiscal years 2001 through 2005. Such sums shall remain available until expended.

"(2) PUBLIC EDUCATION PROJECTS.—Not more than 15 percent of the amount appropriated pursuant to paragraph (1) in a fiscal year may be expended on grants for public education projects under subsection (d)(2).".

TITLE VI—ALTERNATIVE WATER SOURCES

Alternative Water Sources Act of 2000. 33 USC 1251 note.

SEC. 601. SHORT TITLE.

This title may be cited as the "Alternative Water Sources Act of 2000".

SEC. 602. PILOT PROGRAM FOR ALTERNATIVE WATER SOURCE PROJECTS.

Title II of the Federal Water Pollution Control Act (33 U.S.C. 1281 et seq.) is amended by adding at the end the following:

"SEC. 220. PILOT PROGRAM FOR ALTERNATIVE WATER SOURCE PROJECTS.

33 USC 1300.

"(a) POLICY.—Nothing in this section shall be construed to affect the application of section 101(g) of this Act and all of the provisions of this section shall be carried out in accordance with the provisions of section 101(g).

"(b) IN GENERAL.—The Administrator may establish a pilot program to make grants to State, interstate, and intrastate water resource development agencies (including water management districts and water supply authorities), local government agencies, private utilities, and nonprofit entities for alternative water source projects to meet critical water supply needs.

"(c) ELIGIBLE ENTITY.—The Administrator may make grants under this section to an entity only if the entity has authority under State law to develop or provide water for municipal, industrial, and agricultural uses in an area of the State that is experiencing critical water supply needs.

"(d) SELECTION OF PROJECTS.—

"(1) LIMITATION.—A project that has received funds under the reclamation and reuse program conducted under the Reclamation Projects Authorization and Adjustment Act of 1992 (43 U.S.C. 390h et seq.) shall not be eligible for grant assistance under this section.

"(2) ADDITIONAL CONSIDERATION.—In making grants under this section, the Administrator shall consider whether the project is located within the boundaries of a State or area referred to in section 1 of the Reclamation Act of June 17, 1902 (32 Stat. 385), and within the geographic scope of the reclamation and reuse program conducted under the Reclamation Projects Authorization and Adjustment Act of 1992 (43 U.S.C. 390h et seq.).

"(3) GEOGRAPHICAL DISTRIBUTION.—Alternative water source projects selected by the Administrator under this section shall reflect a variety of geographical and environmental conditions.

"(e) COMMITTEE RESOLUTION PROCEDURE.—

"(1) IN GENERAL.—No appropriation shall be made for any alternative water source project under this section, the total Federal cost of which exceeds $3,000,000, if such project has not been approved by a resolution adopted by the Committee on Transportation and Infrastructure of the House of Representatives or the Committee on Environment and Public Works of the Senate.

"(2) REQUIREMENTS FOR SECURING CONSIDERATION.—For purposes of securing consideration of approval under paragraph (1), the Administrator shall provide to a committee referred to in paragraph (1) such information as the committee requests and the non-Federal sponsor shall provide to the committee information on the costs and relative needs for the alternative water source project.

"(f) USES OF GRANTS.—Amounts from grants received under this section may be used for engineering, design, construction, and final testing of alternative water source projects designed to meet critical water supply needs. Such amounts may not be used for planning, feasibility studies or for operation, maintenance, replacement, repair, or rehabilitation.

"(g) COST SHARING.—The Federal share of the eligible costs of an alternative water source project carried out using assistance made available under this section shall not exceed 50 percent.

Deadline.

"(h) REPORTS.—On or before September 30, 2004, the Administrator shall transmit to Congress a report on the results of the pilot program established under this section, including progress made toward meeting the critical water supply needs of the participants in the pilot program.

"(i) DEFINITIONS.—In this section, the following definitions apply:

"(1) ALTERNATIVE WATER SOURCE PROJECT.—The term 'alternative water source project' means a project designed to provide municipal, industrial, and agricultural water supplies in an environmentally sustainable manner by conserving, managing, reclaiming, or reusing water or wastewater or by treating wastewater. Such term does not include water treatment or distribution facilities.

"(2) CRITICAL WATER SUPPLY NEEDS.—The term 'critical water supply needs' means existing or reasonably anticipated future water supply needs that cannot be met by existing water supplies, as identified in a comprehensive statewide or regional water supply plan or assessment projected over a planning period of at least 20 years.

"(j) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section a total of $75,000,000 for fiscal years 2002 through 2004. Such sums shall remain available until expended.".

TITLE VII—CLEAN LAKES

SEC. 701. GRANTS TO STATES.

Section 314(c)(2) of the Federal Water Pollution Control Act (33 U.S.C. 1324(c)(2)) is amended by striking "$50,000,000" the first place it appears and all that follows through "1990" and inserting "$50,000,000 for each of fiscal years 2001 through 2005".

SEC. 702. DEMONSTRATION PROGRAM.

Section 314(d) of the Federal Water Pollution Control Act (33 U.S.C. 1324(d)) is amended—

(1) in paragraph (2) by inserting "Otsego Lake, New York; Oneida Lake, New York; Raystown Lake, Pennsylvania; Swan Lake, Itasca County, Minnesota; Walker Lake, Nevada; Lake Tahoe, California and Nevada; Ten Mile Lakes, Oregon;

Woahink Lake, Oregon; Highland Lake, Connecticut; Lily Lake, New Jersey; Strawbridge Lake, New Jersey; Baboosic Lake, New Hampshire; French Pond, New Hampshire; Dillon Reservoir, Ohio; Tohopekaliga Lake, Florida; Lake Apopka, Florida; Lake George, New York; Lake Wallenpaupack, Pennsylvania; Lake Allatoona, Georgia;" after "Sauk Lake, Minnesota;";

(2) in paragraph (3) by striking "By" and inserting "Notwithstanding section 3003 of the Federal Reports Elimination and Sunset Act of 1995 (31 U.S.C. 1113 note; 109 Stat. 734–736), by"; and

(3) in paragraph (4)(B)(i) by striking "$15,000,000" and inserting "$25,000,000".

TITLE VIII—TIJUANA RIVER VALLEY ESTUARY AND BEACH CLEANUP

Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000. Mexico. 22 USC 277d–43 note.

SEC. 801. SHORT TITLE.

This title may be cited as the "Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000".

SEC. 802. PURPOSE.

22 USC 277d–43 note.

The purpose of this title is to authorize the United States to take actions to address comprehensively the treatment of sewage emanating from the Tijuana River area, Mexico, that flows untreated or partially treated into the United States causing significant adverse public health and environmental impacts.

SEC. 803. DEFINITIONS.

22 USC 277d–43.

In this title, the following definitions apply:

(1) ADMINISTRATOR.—The term "Administrator" means the Administrator of the Environmental Protection Agency.

(2) COMMISSION.—The term "Commission" means the United States section of the International Boundary and Water Commission, United States and Mexico.

(3) IWTP.—The term "IWTP" means the South Bay International Wastewater Treatment Plant constructed under the provisions of the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), section 510 of the Water Quality Act of 1987 (101 Stat. 80–82), and Treaty Minutes to the Treaty for the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, dated February 3, 1944.

(4) SECONDARY TREATMENT.—The term "secondary treatment" has the meaning such term has under the Federal Water Pollution Control Act and its implementing regulations.

(5) SECRETARY.—The term "Secretary" means the Secretary of State.

(6) MEXICAN FACILITY.—The term "Mexican facility" means a proposed public-private wastewater treatment facility to be constructed and operated under this title within Mexico for the purpose of treating sewage flows generated within Mexico, which flows impact the surface waters, health, and safety of the United States and Mexico.

(7) MGD.—The term "mgd" means million gallons per day.

22 USC 277d–44.

SEC. 804. ACTIONS TO BE TAKEN BY THE COMMISSION AND THE ADMINISTRATOR.

(a) SECONDARY TREATMENT.—

(1) IN GENERAL.—Subject to the negotiation and conclusion of a new Treaty Minute or the amendment of Treaty Minute 283 under section 1005 of this Act, and notwithstanding section 510(b)(2) of the Water Quality Act of 1987 (101 Stat. 81), the Commission is authorized and directed to provide for the secondary treatment of a total of not more than 50 mgd in Mexico—

(A) of effluent from the IWTP if such treatment is not provided for at a facility in the United States; and

(B) of additional sewage emanating from the Tijuana River area, Mexico.

(2) ADDITIONAL AUTHORITY.—Subject to the results of the comprehensive plan developed under subsection (b) revealing a need for additional secondary treatment capacity in the San Diego-Tijuana border region and recommending the provision of such capacity in Mexico, the Commission may provide not more than an additional 25 mgd of secondary treatment capacity in Mexico for treatment described in paragraph (1).

Deadline.

(b) COMPREHENSIVE PLAN.—Not later than 24 months after the date of enactment of this Act, the Administrator shall develop a comprehensive plan with stakeholder involvement to address the transborder sanitation problems in the San Diego-Tijuana border region. The plan shall include, at a minimum—

(1) an analysis of the long-term secondary treatment needs of the region;

(2) an analysis of upgrades in the sewage collection system serving the Tijuana area, Mexico; and

(3) an identification of options, and recommendations for preferred options, for additional sewage treatment capacity for future flows emanating from the Tijuana River area, Mexico.

(c) CONTRACT.—

(1) IN GENERAL.—Subject to the availability of appropriations to carry out this subsection and notwithstanding any provision of Federal procurement law, upon conclusion of a new Treaty Minute or the amendment of Treaty Minute 283 under section 5, the Commission may enter into a fee-for-services contract with the owner of a Mexican facility in order to carry out the secondary treatment requirements of subsection (a) and make payments under such contract.

(2) TERMS.—Any contract under this subsection shall provide, at a minimum, for the following:

(A) Transportation of the advanced primary effluent from the IWTP to the Mexican facility for secondary treatment.

(B) Treatment of the advanced primary effluent from the IWTP to the secondary treatment level in compliance with water quality laws of the United States, California, and Mexico.

(C) Return conveyance from the Mexican facility of any such treated effluent that cannot be reused in either Mexico or the United States to the South Bay Ocean Outfall for discharge into the Pacific Ocean in compliance with water quality laws of the United States and California.

(D) Subject to the requirements of subsection (a), additional sewage treatment capacity that provides for advanced primary and secondary treatment of sewage described in subsection (a)(1)(B) in addition to the capacity required to treat the advanced primary effluent from the IWTP.

(E) A contract term of 20 years.

(F) Arrangements for monitoring, verification, and enforcement of compliance with United States, California, and Mexican water quality standards.

(G) Arrangements for the disposal and use of sludge, produced from the IWTP and the Mexican facility, at a location or locations in Mexico.

(H) Maintenance by the owner of the Mexican facility at all times throughout the term of the contract of a 20 percent equity position in the capital structure of the Mexican facility.

(I) Payment of fees by the Commission to the owner of the Mexican facility for sewage treatment services with the annual amount payable to reflect all agreed upon costs associated with the development, financing, construction, operation, and maintenance of the Mexican facility, with such annual payment to maintain the owner's 20 percent equity position throughout the term of the contract.

(J) Provision for the transfer of ownership of the Mexican facility to the United States, and provision for a cancellation fee by the United States to the owner of the Mexican facility, if the Commission fails to perform its obligations under the contract. The cancellation fee shall be in amounts declining over the term of the contract anticipated to be sufficient to repay construction debt and other amounts due to the owner that remain unamortized due to early termination of the contract.

(K) Provision for the transfer of ownership of the Mexican facility to the United States, without a cancellation fee, if the owner of the Mexican facility fails to perform the obligations of the owner under the contract.

(L) The use of competitive procedures, consistent with title III of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 251 et seq.), by the owner of the Mexican facility in the procurement of property or services for the engineering, construction, and operation and maintenance of the Mexican facility.

(M) An opportunity for the Commission to review and approve the selection of contractors providing engineering, construction, and operation and maintenance for the Mexican facility.

(N) The maintenance by the owner of the Mexican facility of all records (including books, documents, papers, reports, and other materials) necessary to demonstrate compliance with the terms of this section and the contract. Records.

(O) Access by the Inspector General of the Department of State or the designee of the Inspector General for audit and examination of all records maintained pursuant to subparagraph (N) to facilitate the monitoring and evaluation required under subsection (d). Records.

(P) Offsets or credits against the payments to be made by the Commission under this section to reflect an agreed upon percentage of payments that the owner of the Mexican facility receives through the sale of water treated by the facility.

(d) IMPLEMENTATION.—

(1) IN GENERAL.—The Inspector General of the Department of State shall monitor the implementation of any contract entered into under this section and evaluate the extent to which the owner of the Mexican facility has met the terms of this section and fulfilled the terms of the contract.

Deadline.

(2) REPORT.—The Inspector General shall transmit to Congress a report containing the evaluation under paragraph (1) not later than 2 years after the execution of any contract with the owner of the Mexican facility under this section, 3 years thereafter, and periodically after the second report under this paragraph.

22 USC 277d–45.

SEC. 805. NEGOTIATION OF NEW TREATY MINUTE.

(a) CONGRESSIONAL STATEMENT.—In light of the existing threat to the environment and to public health and safety within the United States as a result of the river and ocean pollution in the San Diego-Tijuana border region, the Secretary is requested to give the highest priority to the negotiation and execution of a new Treaty Minute, or a modification of Treaty Minute 283, consistent with the provisions of this title, in order that the other provisions of this title to address such pollution may be implemented as soon as possible.

(b) NEGOTIATION.—

(1) INITIATION.—The Secretary is requested to initiate negotiations with Mexico, within 60 days after the date of enactment of this Act, for a new Treaty Minute or a modification of Treaty Minute 283 consistent with the provisions of this title.

(2) IMPLEMENTATION.—Implementation of a new Treaty Minute or of a modification of Treaty Minute 283 under this title shall be subject to the provisions of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(3) MATTERS TO BE ADDRESSED.—A new Treaty Minute or a modification of Treaty Minute 283 under paragraph (1) should address, at a minimum, the following:

(A) The siting of treatment facilities in Mexico and in the United States.

(B) Provision for the secondary treatment of effluent from the IWTP at a Mexican facility if such treatment is not provided for at a facility in the United States.

(C) Provision for additional capacity for advanced primary and secondary treatment of additional sewage emanating from the Tijuana River area, Mexico, in addition to the treatment capacity for the advanced primary effluent from the IWTP at the Mexican facility.

(D) Provision for any and all approvals from Mexican authorities necessary to facilitate water quality verification and enforcement at the Mexican facility.

(E) Any terms and conditions considered necessary to allow for use in the United States of treated effluent from the Mexican facility, if there is reclaimed water which is surplus to the needs of users in Mexico and such use is consistent with applicable United States and California law.

(F) Any other terms and conditions considered necessary by the Secretary in order to implement the provisions of this title.

SEC. 806. AUTHORIZATION OF APPROPRIATIONS. 22 USC 277d–46.

There is authorized to be appropriated a total of $156,000,000 for fiscal years 2001 through 2005 to carry out this title. Such sums shall remain available until expended.

TITLE IX—GENERAL PROVISIONS

SEC. 901. PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS. 33 USC 2901 note.

(a) IN GENERAL.—It is the sense of Congress that, to the extent practicable, all equipment and products purchased with funds made available under this Act should be American made.

(b) NOTICE TO RECIPIENTS OF ASSISTANCE.—The head of each Federal Agency providing financial assistance under this Act, to the extent practicable, shall provide to each recipient of the assistance a notice describing the statement made in subsection (a).

SEC. 902. LONG-TERM ESTUARY ASSESSMENT. Mississippi. 33 USC 2901 note.

(a) IN GENERAL.—The Secretary of Commerce (acting through the Under Secretary for Oceans and Atmosphere) and the Secretary of the Interior (acting through the Director of the Geological Survey) may carry out a long-term estuary assessment project (in this section referred to as the "project") in accordance with the requirements of this section.

(b) PURPOSE.—The purpose of the project shall be to establish a network of strategic environmental assessment and monitoring projects for the Mississippi River south of Vicksburg, Mississippi, and the Gulf of Mexico, in order to develop advanced long-term assessment and monitoring systems and models relating to the Mississippi River and other aquatic ecosystems, including developing equipment and techniques necessary to implement the project.

(c) MANAGEMENT AGREEMENT.—To establish, operate, and implement the project, the Secretary of Commerce and the Secretary of the Interior may enter into a management agreement with a university-based consortium.

(d) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated—

(1) $1,000,000 for fiscal year 2001 to develop the management agreement under subsection (c); and

(2) $4,000,000 for each of fiscal years 2002, 2003, 2004, and 2005 to carry out the project.

Such sums shall remain available until expended.

SEC. 903. RURAL SANITATION GRANTS.

Section 303(e) of the Safe Drinking Water Act Amendments of 1996 (33 U.S.C. 1263a(e)) is amended by striking "$15,000,000" and all that follows through "section." and inserting the following: "to carry out this section $40,000,000 for each of fiscal years 2001 through 2005.".

Approved November 7, 2000.

LEGISLATIVE HISTORY—S. 835 (H.R. 1775) (H.R. 3039):

HOUSE REPORTS: Nos. 106–550 accompanying H.R. 3039 (Comm. on Transportation and Infrastructure), 106–561, Pt. 1 (Comm. Transportation and Infrastructure) and Pt. 2 (Comm. on Resources) both accompanying H.R. 1775, and 106–995 (Comm. of Conference).

SENATE REPORTS: No. 106–189 (Comm. on Environment and Public Works).

CONGRESSIONAL RECORD Vol. 146 (2000):

Mar. 30, considered and passed Senate.
Sept. 12, considered and passed House, amended.
Oct. 23, Senate agreed to conference report.
Oct. 25, House agreed to conference report.

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APPENDIX D
SHORE AND OCEAN DISCHARGE MODELING REPORT

APPENDIX D – SHORE AND OCEAN DISCHARGE MODELING REPORT

An ocean contaminant transport modeling study for coastal discharge was prepared in support of the Supplemental Environmental Impact Statement (SEIS) for Clean Water Act Compliance of effluent from the South Bay International Wastewater Treatment Plant (SBIWTP) in San Diego, California. The ocean contaminant transport modeling study was conducted to support evaluation of the alternatives in the Draft SEIS. This study evaluated potential impacts of bacterial concentrations that would occur as a result of different wastewater effluent flows from alternative treatment scenarios. This appendix is a synopsis of the Shore and Ocean Discharge Modeling Report for Clean Water Act Compliance at the SBIWTP (October 2004), which is available upon request from the United States Section of the International boundary and Water Commission (USIBWC).

This study identified the time-dependent distributions of bacterial concentration along the coast of California north and south of a shore-based discharge of wastewater at Punta Bandera, Baja California. These distributions were evaluated out to determine whether the California Ocean Plan requirements would be met for the waters extending north of the United States/Mexico border. The impacts on the initial dilution achieved by the SBOO discharge for varying flows and levels of treatment also will be modeled.

The California Ocean Plan is the state's water quality control plan for ocean waters. Among the Plan's high priority issues is an increased stringency of the water contact fecal coliform standard. The current standard requires:

> *"Sample of water from each sampling station shall have a density of total coliform organism less than 1,000 per 100 milliliters (mL) (or 10 per mL); provided that not more than 20 percent of the samples at any sampling station, in any 30 day period, may exceed 1,000 per 100 mL (10 per mL), and provided further that not a single sample, when verified by a repeat sample taken within 48 hours, shall exceed 10,000 per 100 mL (100 per mL)."*

D.1 BACKGROUND

Sewage contamination problems in the Tijuana River Valley area have been chronic since the 1930s due to rapid growth and inadequate sewerage infrastructure in Mexico. The physiographic setting of Tijuana at the United States border results in the flow of sewage from Tijuana that is not captured or treated. This sewage flows into the United States via the Tijuana River as well as canyons and gullies draining to the north. The SBIWTP, constructed in 1997, provides advanced primary treatment of sewage originating from Tijuana and then discharges treated effluent through the South Bay Ocean Outfall (SBOO).

Sewage flows have caused quarantines of beaches along the south San Diego coast and have adversely impacted the Tijuana River estuary, a National Estuarine Research Reserve.

D.2 TREATMENT ALTERNATIVES

The USIBWC is evaluating options for providing secondary treatment at the SBIWTP or through another private or public entity. Other options include redirecting some or all of the SBIWTP effluent from California's waters, or the use of other means of treatment, or the institution of a combination of these options. The alternatives developed will enable wastewater flows to be treated in compliance with the Clean Water Act. Alternatives formulation was the result of a public consultation process that included regulatory agencies. This study evaluates the water quality, in terms of projecting potential bacterial concentrations, associated with the seven alternative treatment options for Clean Water Act compliance.

D.3 STUDY METHODOLOGY

The Shore Discharge Model (SDM) was used to evaluate the transport of ocean contaminants. This model was developed in an earlier study to examine pollutant distributions (bacteria and conservative material) discharged from Punta Bandera. This study differs from the previous study in that a single discharge having different volume and pollutant concentrations was modeled. The SDM model is described in detail in *Wastewater Discharge Modeling and Analysis of Alternative Interim Disposal Options* prepared by Parsons in 1996.

An area extending from south of Punta Bandera to north of Point Loma and from the coast to offshore is divided into three regions of rectangular cells. The inner region lies adjacent to the coast (wave-dominated processes of dispersion), an outer region lies offshore (dominated by oceanic processes), and a transition region lies between these two. The model contains about 13,000 cells and extends 25 km upcoast of Punta Bandera, 5 km downcoast, and about 4.1 km offshore from the coast.

Wastewater is discharged into the inner grid cell near the coast at Punta Bandera. The discharge rate and concentrations can vary throughout the day. As wastewater is discharged into the ocean, it is transported by the currents and mixed with adjacent ocean water. The mixing results from turbulent eddies in both the nearshore and offshore grids, and also via the action of rip-current cells in the inner grid. Currents in the nearshore zone are driven by the height, period, and direction of approach of the waves, and currents in the offshore zone are driven by the coastal currents. Five years of time-series of wave characteristics generated from the statistical properties of waves measured by an offshore wave recording buoy are used to drive the nearshore transport, and current measurements previously collected off South Bay are used for the time-series of ocean currents in the simulations.

The model computes the temporal evolution of the concentration of a constituent of interest (e.g., bacterial concentrations) in each simulation cell. These concentrations are determined by the discharge rate, the concentration in the effluent, the nearshore and offshore currents, and the strengths of the eddy and rip-current mixing.

D.4 DISCHARGE AT PUNTA BANDERA

Sewered wastewaters from the City of Tijuana, Baja California (B.C.), Mexico, and the developed coastal areas south and west of the city are treated at the SBIWTP in the United States or are bypassed for treatment at the San Antonio de los Buenos Wastewater Treatment Plant (SABWWTP) in Mexico.

The SABWWTP is about 6 km south of the United States-Mexico border. Recently upgraded with high-rate aerated lagoons, the plant can treat about 25 mgd of influent. Flows greater than 25 mgd can bypass the plant and can be discharged, along with the treated plant effluent, into the at San Antonio de los Buenos creek and then across the beach at Punta Bandera, about 9 km south of the border. Effluent from this discharge could be transported upcoast (north) by the nearshore and coastal currents and into United States waters.

The nine effluent discharge scenarios examined in this study (seven alternatives and three flow horizons) alter the quantity and quality of the wastewaters discharged at Punta Bandera, and hence, the potential for contamination north of the border. The effects of the Punta Bandera discharge, and changes in these effects associated with changes in the discharge scenarios, were examined using the computer numerical simulation model known as the SDM.

Alternatives were evaluated for total coliform only. The current study is intended to update a similar 1996 study and applies the same methodology. Total coliform is still preferred as an indicator (while other more meaningful indicators are being evaluated) because of the relative simplicity and low cost of the analysis and the long track record of the monitored sites. In addition, in spite of its perceived limitations, this indicator shows a remarkable correlation with bacterial contamination. This indicator was used in both the 1996 and the present study, not for the reasons listed above, but because in the 1996 study, a preliminary evaluation showed this indicator to be the most stringent parameter of compliance.

This study does not assess compliance based on the monitoring data; rather, it compares the proposed alternatives on the likelihood of compliance for several potential treatment and discharge scenarios.

D.5 OCEAN DISCHARGE

Discharge of treated effluent through the SBOO was also studied. Depending on the alternative considered, average flows as high as 59 mgd will be discharged through this facility. Modeling of the SBOO discharges is limited to evaluation of the impacts of varying initial dilutions that can be attained at different flows. This evaluation was limited to a comparison of initial dilutions with those attained in the 1996 study and the inferences of the changes that could be expected at the shoreline monitoring stations.

D.6 FINDINGS

The principal findings of this study are summarized below.

D.6.1 Coastal Discharge at Punta Bandera

- Depending on the alternative and the corresponding quantity of flow discharged, bacterial concentrations at certain coastal stations may not comply with California Ocean Plan standards at certain times of the year. Table D-1 summarizes the projected monthly bacterial compliance for each alternative.

Table D-1. Comparison of Compliance for Bacterial Concentrations

Alt.	Description	Year	Flow (mgd)	Conc. ($\times 10^6$ MPN/ 100mL)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1A	No Action Alternative (Continued Operation of SBIWTP as Advanced Primary Facility)	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	40	30.98	0.0005	0.0003	Yes	0.0009	Yes	0.0004	0.0052	0.0036	0.0003	0.0021	0.0015	0.002
		2023	50	31.86	0.0005	0.0005	Yes	0.0009	Yes	0.0005	0.0068	0.0051	0.0005	0.0026	0.0018	0.002
1B		2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	40	30.98	0.0005	0.0003	Yes	0.0009	Yes	0.0004	0.0052	0.0036	0.0003	0.0021	0.0015	0.002
		2023	59	32.4	0.0005	0.0009	0.0001	0.0012	Yes	0.0005	No	No	0.0005	0.0034	0.0018	0.0028
2	Operate SBIWTP as Advanced Primary Facility with Treated Flows Conveyed to Mexico	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	65	29.95	0.0005	0.0019	0.0003	0.0012	Yes	0.0005	No	No	0.0005	0.0032	0.0022	0.0033
		2023	84	31.19	0.0008	0.0024	0.0004	0.0015	0.0001	0.0019	No	No	0.0021	0.0048	0.0027	0.0052
3	Operate SBIWTP with City of San Diego Connection	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	51	30.4	0.0005	0.0005	Yes	0.0009	Yes	0.0005	0.0063	0.0051	0.0005	0.0023	0.0018	0.002
		2023	70	31.76	0.0005	0.0019	0.0004	0.0015	Yes	0.0017	No	No	0.0009	0.0046	0.002	0.0041
4A, 4B, 4C Option I	PL 106-457 Facility (Secondary Treatment in Mexico)	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	25	28.32	0.0003	Yes	Yes	Yes	Yes	0.0001	0.0018	0.0012	Yes	0.0011	0.0004	0.0007
		2023	25	28.32	0.0003	Yes	Yes	Yes	Yes	0.0001	0.0018	0.0012	Yes	0.0011	0.0004	0.0007
4A, 4B, 4C Option II		2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	65	28.32	0.0005	0.0017	0.0003	0.0012	Yes	0.0005	No	No	0.0005	0.0026	0.0022	0.0028
		2023	84	28.32	0.0005	0.0019	0.0004	0.0015	0.0001	0.0017	No	No	0.0017	0.0048	0.0027	0.0042
5A, 5B	Secondary Treatment in U.S. (CMA Ponds/ Activated Sludge)	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	40	30.98	0.0005	0.0003	Yes	0.0009	Yes	0.0004	0.0052	0.0036	0.0003	0.0021	0.0015	0.002
		2023	59	32.4	0.0005	0.0009	0.0001	0.0012	Yes	0.0005	No	No	0.0005	0.0034	0.0018	0.0028
6	Secondary Treatment at SBIWTP and in Mexico	2004	31	29.69	0.0003	0.0003	Yes	0.0001	Yes	0.0001	0.0032	0.0016	Yes	0.0016	0.0008	0.0014
		2009	25	28.32	0.0003	Yes	Yes	Yes	Yes	0.0001	0.0018	0.0012	Yes	0.0011	0.0004	0.0007
		2023	25	28.32	0.0003	Yes	Yes	Yes	Yes	0.0001	0.0018	0.0012	Yes	0.0011	0.0004	0.0007
7	Closure/Shutdown of SBIWTP	2004	56	32.24	0.0005	0.0012	0.0001	0.0012	Yes	0.0005	No	No	0.0005	0.0026	0.0018	0.0028
		2009	65	32.68	0.0005	0.0019	0.0004	0.0012	Yes	0.0013	No	No	0.0008	0.0037	0.0023	0.0036
		2023	84	33.29	0.0008	0.0024	0.0004	0.0015	0.0001	0.0022	No	No	0.0023	0.0051	0.003	0.0052

Yes = Bacterial concentrations in this month would comply with standard.
No = Bacterial concentrations in this month would not comply with standard.

Note: Numerical values shown in each monthly column is the probability of exceeding the standard

- The probability of meeting the standards is higher for stations farther north (farther away from the source) and for smaller discharges.
- A review of the USIBWC monitoring data indicates a high concentration of bacteria at stations close to, and north of, the mouth of the Tijuana River. The data is seasonal and appears to be superimposed on the concentrations associated with the Punta Bandera coastal discharge. Even during the summer months the levels appear to be higher than expected in this area, which could indicate residual bacterial contamination in the surface and, possibly, in the underground flows to the sea.
- While calibrating the SDM, it became apparent that the effluent from the San Antonio de los Buenos Wastewater Treatment Plant is disinfected three out of four days. This reduces the probability of noncompliance with the bacterial standard in United States waters. Based on the Punta Bandera discharge alone for all alternatives modeled, all stations north of the border have a less than 20 percent probability of samples exceeding 1,000 TC/100 mL. The worst case modeled is Alternative 7 (SBIWTP Closure/Shutdown), year 2023, with 84 mgd total flow discharged (25 mgd treated at the SABWWTP and 59 mgd untreated). In this case, the peak 30-day period had a probability of less than 17 percent. Averaging the results based on five years of wave data leads to the conclusion that this alternative would comply with this standard. Within the statistical variability of the five years modeled, however, the samples could exceed the 1,000 TC/100 mL threshold during some periods.
- At the border sampling station, the 10,000 TC/100 mL standard has a probability of being violated once every 5.7 years. The probability is reduced at the northern stations.
- Much like the 1996 study, no substantial difference is noted between the several scenarios and discharged flows in term of meeting the bacterial standards. This is because the bacterial standards are based on a probability of exceeding a threshold value rather than on a parametric measure of concentrations (e.g., mean, median). Hence, a probabilistic standard based on threshold concentrations tends to mask out concentration differences among discharge scenarios.
- Based on the Punta Bandera discharge alone, a higher probability of noncompliance is predicted during July and August. The prediction is based on relatively high waves from subtropical storms from Mexico causing a faster transport to the north of the discharged wastefield.
- To properly calibrate the model, only the monitoring data for the no-river outflow periods were used. Both the monitoring data and the model indicate a bacteria reduction trend toward the north.

D.6.2 SBOO Discharge

- The discharge through the SBOO always achieves an initial dilution of at least 100 to 1 for all flows considered. As the flow increases, so do the number of outfall ports that will be open and discharging. The median initial dilution for the SBOO discharge varies between 193 and 199 to 1.

- On an annual basis, about 50 percent of the wastefield is predicted to be below 15 m while about 75 percent of the wastefield will be below 10 m. About 15 percent of the wastefield will be located between 5 m and the surface. This percentage is higher than what was predicted in the 1996 study and is partially the result of an improved model better able to simulate surfacing field conditions.

- The wastefield will be higher in the water column from December to January. During that time, the initial dilution will be the highest with values greater than 500 to 1.

- The concentration of TC bacteria used in the current modeling effort was 5.7 times less than that used in the 1996 modeling. The bacterial concentration used in the 1996 modeling was derived from limited data on the strength of the Mexican sewage and by making certain assumptions on the level of reduction in the treatment process. In the current modeling, the lower concentration was derived from analyses of effluent samples taken daily for a week in March 2004.

- Relocating the diffuser in waters off Mexico would not change the performance of the diffuser modeled in this study. The statement is based on the understanding that the relocated diffuser will be at the same depth and orientation as the existing one. It is further assumed that the new discharge would be exposed to very similar current patterns.

- Based on the findings, it is concluded that the 1996 predictions of bacterial concentrations at the shore monitoring stations are not likely to be exceeded for any alternatives with discharge from the SBOO.

APPENDIX E
ECOLOGICAL RISK ASSESSMENT

DRAFT
SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Clean Water Act Compliance
at the
South Bay International Wastewater Treatment Plant

APPENDIX E
ECOLOGICAL RISK ASSESSMENT

December 2004

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ACRONYMS

Acronym	Definition
CMA	completely mixed aeration
COC	contaminants of concern
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
HCH	hexachlorocyclohexane
HQ	hazard quotient
IWTP	International Wastewater Treatment Plant
mgd	million gallons per day
mg/L	milligrams per liter
MWWD	(San Diego) Metropolitan Wastewater Department
NEPA	National Environmental Policy Act
NPDES	national pollutant discharge elimination system
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PLWTP	Point Loma Wastewater Treatment Plant
SABWWTP	San Antonio de los Buenos Wastewater Treatment Plant
SBIWTP	South Bay International Wastewater Treatment Plant
SBOO	South Bay Ocean Outfall
SEIS	Supplemental Environmental Impact Statement
SWBRP	South Bay Water Reclamation Plant
TSS	total suspended solids
USIBWC	United States Section, International Boundary and Water Commission

1.0 INTRODUCTION

1.1 ERA OBJECTIVE

The United States Section of the International Boundary and Water Commission (USIBWC) is evaluating the potential environmental impacts of sewage treatment and disposal alternatives at the South Bay International Wastewater Treatment Plant (SBIWTP). The SBIWTP and its system of canyon collectors prevent dry weather flows of raw sewage from flowing across the border into the Tijuana River Valley, Tijuana Estuary and south San Diego beaches. The SBIWTP treats an average of 25 million gallons per day (mgd) of raw sewage originating from Tijuana and then discharges the treated effluent 3.5 miles out into the Pacific Ocean through the South Bay Ocean Outfall (SBOO). Alternatives under consideration address modifications in current sewage treatment levels and ocean disposal over a 20-year period, as well as changes in routing of the effluent for disposal south of the United States/Mexico border, at Punta Bandera, Baja California.

This Ecological Risk Assessment (ERA) was prepared as part of the Supplemental Environmental Impact Statement (SEIS) in support of the alternatives evaluation. The risk characterization is based on the use of ecological quotients, the ratio of expected exposure concentrations to reference values indicative of potential adverse effects on receptor organisms.

This ERA evaluates the potential risks of effluent routing and disposal as they relate to:

- Potential impacts on marine biota in the SBOO area of influence due to modified treatment levels and associated changes in effluent quality and sediment release.
- Transboundary effects in terms of protection of marine biota from coastal discharges originating in Mexico.

Potential effects in Mexican jurisdictional waters are not included in this risk assessment. Detrimental effects on water quality and coastal biota are expected due to current wastewater discharges at Punta Bandera, and those conditions would deteriorate further as the flow of untreated wastewater increases.

1.2 ERA ELEMENTS

The ERA was prepared in accordance with the United States Environmental Protection Agency (USEPA) *Guidelines for Ecological Risk Assessment* (USEPA/630/R-95/002F, April 1998) and the California State guidelines (Guidance for Ecological Risk Assessment at Hazardous Waste Facilities and Permitted Facilities, California Environmental Protection Agency, Human and Ecological Risk Division, July 4, 1996). The ERA is organized into four main elements:

- *Problem Formulation*, the description of potentially-exposed aquatic ecosystems, and the formulation of exposure scenarios including exposure pathways and ecological receptors based on site characterization.
- *Exposure Assessment*, an evaluation of exposure conditions and transfer factors, either by direct contact with water and sediments, or through food ingestion.

- *Characterization of Ecological Effects*, the selection of reference values for potential effects, and the extrapolation of these values to the site eco-receptors.
- *Risk Characterization*, the use of ecological quotients and an evaluation of the uncertainty of the risk assessment.

1.3 ALTERNATIVES UNDER CONSIDERATION

The USIBWC considered a range of alternative treatment and discharge options for wastewater now treated at the SBIWTP. The seven alternatives screened and selected for evaluation of potential impacts are described in Chapter 2 of the Draft SEIS. Key features of those alternatives are listed below. Figure 1 compares the treatment levels and locations of the alternatives.

- **Alternative 1:** No Action (Operation of SBIWTP as Advanced Primary Facility)
  - Option A: With No Future Improvements to Mexico's Existing Conveyance Facilities
  - Option B: With Future Improvements to Existing Conveyance Facilities
- **Alternative 2:** Operate SBIWTP as Advanced Primary Facility with Treated Flows Conveyed To Mexico for Discharge via PERC/Mexico's Facilities
- **Alternative 3:** Operate SBIWTP with City of San Diego Connections
- **Alternative 4:** Secondary Treatment Facility in Mexico (Public Law 106-457)
  - Treatment Option A: Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Treatment Option B: Cease Operation of SBIWTP, Secondary Treatment in Mexico
  - Treatment Option C: Bajagua LLC Proposal – Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico
  - Discharge Option I: Treated Effluent Discharged in United States via SBOO
  - Discharge Option II: Treated Effluent Discharged at Punta Bandera, Mexico
- **Alternative 5:** Secondary Treatment in the United States at SBIWTP
  - Option A: Completely Mixed Aeration (CMA) Ponds at SBIWTP
  - Option B: Activated Sludge Secondary Treatment at SBIWTP, With Flow Equalization or Expanded Capacity (Suboptions 5B-1 and 5B-2)

    [*Note: Both suboptions are evaluated jointly in the risk assessment as no differences in flow or effluent quality are expected*]
- **Alternative 6:** Secondary Treatment in the United States and in Mexico
- **Alternative 7:** SBIWTP Closure/Shutdown

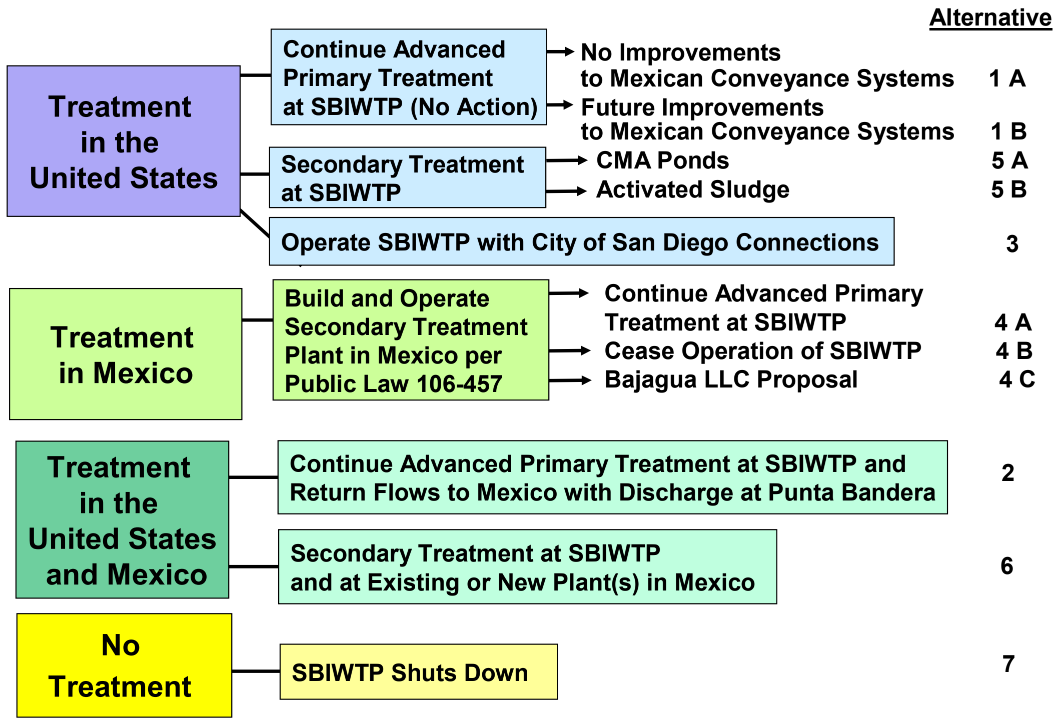

Figure 1. Alternatives by Level of Treatment and Location

1.4 EFFLUENT ROUTING AND DISPOSAL

Table 1 summarizes the expected routing of the City of Tijuana's wastewater and level of treatment by the alternatives considered in the SEIS. All tables cited in the text appear at the end of the assessment.

The city's 2004 sewage generation of 56 mgd is expected to increase to 65 mgd by 2009 and reach an estimated 84 mgd by 2023. Flows would be routed primarily to two locations: the South Bay Ocean Outfall and the Punta Bandera shoreline discharge about 6 miles south of the United States/Mexico border.

At the SBOO, a release of 25 mgd of advanced primary effluent from the SBIWTP would continue unmodified under the No Action Alternative. The alternatives being considered would improve effluent quality at the SBOO by adding secondary treatment (at the SBIWTP, the San Diego facilities, or in Mexico), route the treated effluent back to Mexico for shoreline discharge at Punta Bandera, and discontinue SBIWTP operation. An increase of up to 59 mgd in secondary effluent discharge through the SBOO is also being considered.

At Punta Bandera, the current coastal discharge of 25 mgd of facultative lagoon effluent would continue unmodified under the No Action Alternative. However, the current release of untreated wastewater would increase from 6 mgd to 15 mgd in 2009 and to 34 mgd in 2023. For several alternatives, primary or secondary treatment would be provided for untreated wastewater releases (at the SBIWTP or in aerated lagoon systems in Mexico). In Alternative 7, discontinued SBIWTP operation would add 25 mgd of untreated discharges at Punta Bandera, totaling 59 mgd in 2023.

Additional wastewater releases are also possible at two other locations.

- Under the No Action Alternative (Option A), up to 9 mgd of untreated wastewater could reach the Tijuana River if the city's wastewater generation exceeds the 50 mgd collection system routing capacity of untreated water flows to Punta Bandera.
- Under Alternative 3, up to 14 mgd of primary effluent from the SBIWTP would be transferred for discharge at the Point Loma Outfall operated by the City of San Diego. Of this flow, 5 mgd could be released through the SBOO after secondary treatment at the city's South Bay Water Reclamation Plant.

1.5 PRIOR RISK EVALUATION

An ecological risk evaluation was conducted for SBOO discharges as part of the Supplemental EIS for Long Term Treatment Options of the SBIWTP (Appendix D of CH2M Hill, 1998). The evaluation considered seven options for additional treatment of the 25 mgd primary effluent discharge. Of the options considered in 1998, two were retained for further evaluation in the current SEIS for Clean Water Act compliance:

- Continued operation of the SBIWTP as an advanced primary facility, retained in the current SEIS as the No Action Alternative (Alternative 5 in the 1998 ERA).
- Addition of secondary treatment using completely mixed aerated lagoons or an activated sludge system, retained in the current SEIS as Alternative 5, Options A and B, respectively (Alternatives 4 Option A and Alternative 3, respectively, in the 1998 ERA).

The 1998 assessment concluded that ecological risk from the effluent was expected to occur only immediately near the outfall. While the undiluted effluent discharge was expected to contribute metals and organic contaminants at levels exceeding chronic exposure levels, the allowable 100:1 dilution factor for effluent discharge would eliminate potential toxicity at the edge of the permitted mixing zone.

For sediment fallout from the SBOO, the 1998 ERA showed the possibility of several metals and organic contaminants exceeding chronic toxicity thresholds in the newly settled particulate matter. Under conditions produced by some alternatives, a small ecological risk of chronic toxicity to sedentary benthic organisms immediately around the diffusers was identified. The estimated rates for sediment deposition were considered too low to expect significant risk to benthic communities by direct burial.

The 1998 evaluation concluded that pond treatment alternatives consistently had the least potential for ecological risk due to their lower final effluent concentrations. The highest risk came from lower levels of treatment (partial secondary and advanced primary treatments).

2.0 PROBLEM FORMULATION

This section briefly describes the regional setting for the discharge locations, provides a conceptual model for exposure of ecological receptor to contaminants, and identifies potential contaminants of concern (COC).

2.1 REGIONAL SETTING

Treatment Facilities

The SBIWTP occupies about 75 acres in San Diego County, directly north of Tijuana, Mexico. The SBIWTP is in the Tijuana River watershed, about 3.75 miles east of the Tijuana River Estuary. On the United States side of the border, the area around the SBIWTP and alternative treatment sites is largely undeveloped and sparsely populated. Much of the surrounding land is publicly owned. Agriculture, ranches and quarries occupy private lands. Immediately west of the SBIWTP are lands owned by the City of San Diego, where the South Bay Water Reclamation Plant is located.

In contrast to the SBIWTP setting, lands south of the border are largely developed. Tijuana is a major urban center with extensive industrial activity and a population estimated at 1,270,000 in 2003. Most of the sewer collection system's service area is within the Tijuana River basin, which extends into the United States and reaches the Pacific Ocean. Various infrastructure works intercept the city's wastewater flow for delivery to the San Antonio de los Buenos Wastewater Treatment Plant in southern Tijuana, or route the flow directly to the Punta Bandera discharge location.

Receiving Waters

Under the alternatives being considered, sewage with various levels of treatment would be discharged into the South Bay area at two main locations: the SBOO discharge structure about 3.5 miles west of the San Diego coast and about 1/2 mile north of the United States/Mexico border, and a shoreline discharge at Punta Bandera in Baja California, about 6 miles south of the border. Releases from Punta Bandera could be transported upcoast into the South Bay area by nearshore and coastal currents.

The South Bay, with depths typically ranging from 50 to 100 feet, is part of a broad ocean embayment known as the Southern California Bight. Physical conditions and flow patterns in the region are described in the Shore and Ocean Discharge Modeling Report for the SEIS (Parsons, 2004). The water column is generally well mixed during winter months, with little depth-related variability in any physical parameter. Surface water warming during summer produces stratification by establishing an abrupt water temperature and density change (thermocline).

The City of San Diego has monitored sediments, benthic communities and fish populations in the SBOO area annually starting 3-1/2 years before the outfall began operation in January 1999. The study area is centered around the SBOO discharge and extends along the shoreline from Coronado, California, southward to Playa Blanca in Mexico. Offshore monitoring is conducted in an adjacent area overlying the coastal shelf at sites from 25 to 150 feet deep. Sediments in the South Bay area are dominated by fine sands, with grain size tending to increase with depth. Coarse sediments are found offshore and southward of the outfall discharge, while finer sediments are found toward the mouth of San Diego Bay.

Monitoring data for 2003 showed that concentrations of various trace metals and organic indicators were generally low in SBOO sediments compared with other coastal areas off southern California (City of San Diego, 2004). The highest organic indicator and metal concentrations were associated with the finer sediments. Pesticides, polynuclear aromatic hydrocarbon (PAH) compounds and polychlorinated biphenyls (PCB) either were not detected or were found at very low concentrations in some locations. Assemblages of benthic organisms were typical of natural indigenous communities characteristic of similar habitats on the southern California continental shelf, and similar in composition to those surveyed before SBOO operation. Overall, monitoring program findings have found no evidence to suggest that the discharge affected either fish or benthic communities in the outfall vicinity (City of San Diego, 2004).

In addition to the main discharge locations at SBOO and Punta Bandera, untreated water flows into the Tijuana River and estuary would also take place under the No Action Alternative (Option A) if Tijuana sewage generation eventually exceeds the existing collection system's capacity. Without additional collection capacity, up to 9 mgd of untreated sewage would drain from the Tijuana watershed into the river by 2023. The western Tijuana River valley is designated as the Tijuana River National Estuarine Research Reserve, and was established by the National Oceanic and Atmospheric Administration to protect one of the few remaining large areas of coastal wetland in southern California.

2.2 CONCEPTUAL SITE MODEL

Ecosystems at Risk

Figures 2 and 3 show pathways and receptors for two compliance points, the SBOO area of influence, and at the border between the United States and Mexico where transboundary effects on marine biota could be expected from the Punta Bandera wastewater discharges.

In the SBOO area of influence, the ocean outfall contributes dissolved and particulate-bound contaminants. The primary receptors at risk are benthic organisms and demersal fish that inhabit the South Bay continental shelf. Exposure includes the water column as well as organisms exposed to sediments constituents and excessive sedimentation in the immediate outfall vicinity. Exposure may take place with the water or accumulated sediments and, secondarily, through the food web by ingestion of contaminants in tissues of prey organisms. Given the depth and distance of the discharge from the coastal area, effects on shoreline and coastal biota are not expected. This assumption is supported by the findings of the ongoing long-term monitoring program previously described.

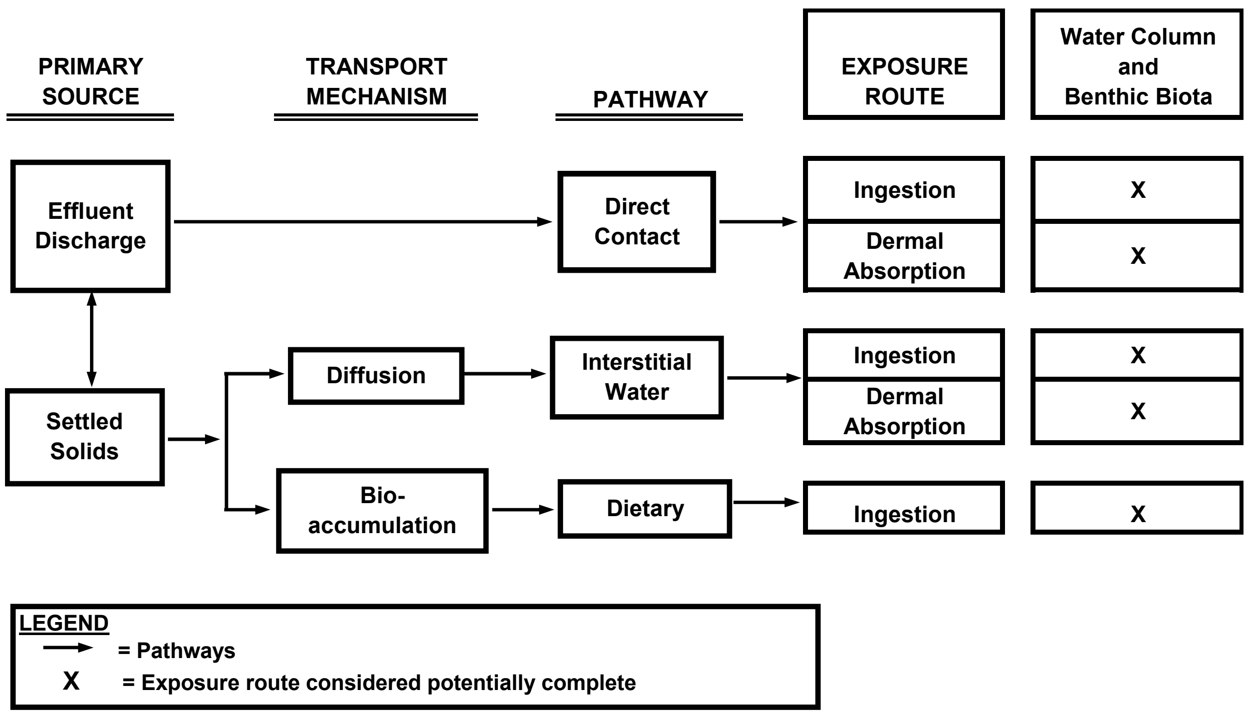

Figure 2. Conceptual Site Model for South Bay Outfall Discharge

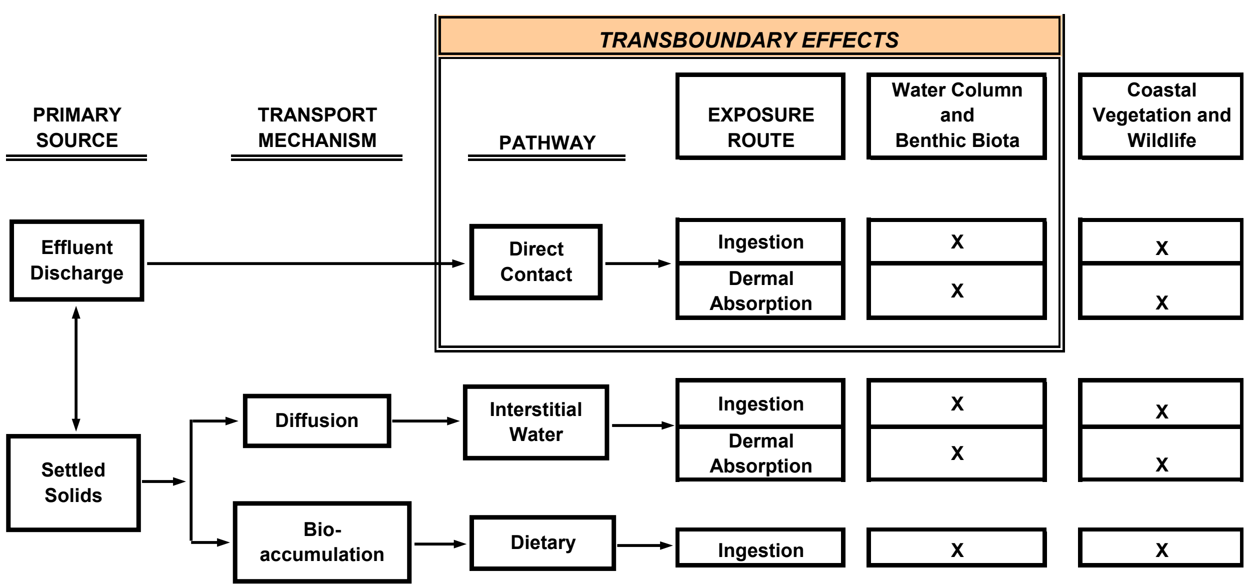

Figure 3. Conceptual Site Model for Punta Bandera Discharge

For the Punta Bandera discharge, coastal ecosystems are a major consideration (Figure 3). In this ecological risk assessment, impacts considered were limited to transboundary effects of the upcoast transport of wastewaters. At the border, the water quality goal is to achieve compliance with the 2001 California Ocean Plan. At the discharge point at Punta Bandera, current impacts from untreated wastewaters are expected to increase as the discharge flow and sediment deposition increase. Analysis of those impacts was excluded from the risk assessment because effects on Mexico jurisdictional waters are not part of the SEIS evaluation.

Receptors and Endpoint Selection

Section 3.1 of the SEIS describes water quality conditions and Section 3.4 describes biological communities. No individual receptors were identified for the risk assessment because water quality criteria were used for reference based on multispecies testing for overall protection of aquatic biota. Thus, compliance with the California Ocean Plan objectives is expected to protect all trophic levels and feeding guilds. The use of water quality criteria also defines the endpoint as a contaminant concentration with a very low probability of adverse effect.

For sediment evaluation, benthic invertebrate and fish fauna are at risk for exposure to constituents and solids settling immediately around the outfall. As with water quality criteria, risk for sediment exposure was based on benchmarks that define the assessment endpoint as a low probability of adverse effects on benthic organisms.

2.3 POTENTIAL CONTAMINANTS OF CONCERN

A primary goal of the long-term alternatives is to evaluate the expected ocean discharges' capacity to comply with state water quality regulations protecting aquatic life. For that evaluation, parameters for protection of marine aquatic life under the 2001 California Ocean Plan (SWRCB, 2001: Table B) were used to compare the potential ecological risks of wastewater treatment and routing alternatives. The 17 parameters were arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, cyanide, ammonia (as nitrogen), endosulfan, endrin, and total concentrations of nonchlorinated phenolic compounds, chlorinated phenolics, and hexachlorocyclohexane (HCH) (based on Lindane, the single detected HCH).

Table 2 presents a summary of monthly monitoring data for the SBIWTP influent and primary effluent from April 2001 to March 2003. The values listed are average and maximum concentrations over the 2-year period from monthly NPDES monitoring reports submitted by USIBWC to the SWRCB. Removal efficiencies based on average values are also listed. Influent data for cadmium, selenium, chlorinated phenolic compounds, endosulfan, endrin, and total HCH (as Lindane), not available from the monitoring program, were obtained from the 1995–1996 Tijuana wastewater characterization study, as reported in the SBOO dispersion model (GDC, 1997: Table A4.4).

Based on monitoring data, chlorinated phenolic substances, endosulfan, and endrin, were excluded from the risk assessment as potential contaminants of concern. Those compounds have not been detected during the ongoing monthly effluent monitoring at the SBIWTP, nor were they detected in the untreated influent during the 1995-1996 Tijuana wastewater characterization study (Table 2).

The use of current and historical wastewater characterization data in the risk evaluation is considered conservative since the City of Tijuana instituted an industrial pretreatment program. The program will identify pollutants of concern and trace pollutants to their sources, meet Mexican and United States standards for the effluent and sludge produced at the SBIWTP, and meet Mexican standards at the San Antonio de los Buenos Wastewater Treatment Plant in Mexico. The initial effort is concentrated on pretreatment activities that relate to the operation of the SBIWTP, especially strategies to reduce elevated acute toxicity levels at the treatment plant.

Effluent toxicity and total chlorine residual, two additional parameters for protection of marine aquatic life listed in the 2001 California Ocean Plan (SWRCB, 2001: Table B) were also evaluated qualitatively for the SBOO discharge. The current discharge of advanced primary effluent complies with the outfall's NPDES permit limits of 0.2 mg/L for 6-month median concentration, and 0.81 mg/L of daily maximum concentration. The SBOO effluent, however, exceeds permit limits for acute toxicity (2 and 1.5 toxic units for weekly and monthly averages, respectively), as well as chronic toxicity (100 toxic units for weekly average).

No analysis was made of toxicity in the Punta Bandera discharge since toxicity is a non-conservative parameter whose changes in response to various treatment levels, and likely reduction during ocean transport to the international border, are unknown. For chlorine residual, also a non-conservative parameter, no information is available on coastal discharge concentration, and likely reduction during ocean transport to the international border.

3.0 EXPOSURE ASSESSMENT

3.1 DISCHARGE CHARACTERIZATION

Table 3 lists the characterization of expected discharges for the levels of treatment under consideration. Estimates for untreated wastewater and advanced primary effluent were obtained from SBIWTP monthly monitoring reports and historical data, as described in Section 2.3. For other levels of treatment, effluent concentrations were calculated by applying a removal efficiency value to the untreated water concentration. Removal efficiencies were obtained as follows:

- *Activated sludge systems* – theoretical removal efficiency data compiled in the SBOO effluent discharge and dispersion study (GDC, 1997: Table 5.7A).

- *Completely Mixed Aeration (CMA) pond systems* – data about metals removal were based on the design data for the CMA pond system at the Hofer sites presented in the evaluation of long-term treatment options for the SBIWTP (CH2M Hill, 1998: Appendix B3, Table 16). Removal rates for HCH and nonchlorinated phenolic compounds are as reported for CMA systems in the effluent discharge and dispersion study for the SBOO (GDC, 1997: Table 5.7A). Zero removal was assumed for ammonia and cyanide. For aerated lagoon treatment systems to be constructed in Mexico, it was assumed that they would achieve removal efficiencies comparable to the CMA system designed for the Hofer site.

- *Facultative Lagoons* – data for the Hofer site CMA pond system were also used to estimate removal for facultative lagoons since the system would include anaerobic zones as initial stages. Removal data for the Hofer site anaerobic zone represented the performance of the facultative lagoon treatment system at San Antonio de los Buenos. Zero removal was assumed for ammonia and cyanide.

3.2 RELEASES AT SBOO

Table 4 lists expected effluent concentrations for SBOO discharges. Releases would range from 5 to 59 mgd with various levels of treatment depending on the alternative. No releases would be associated with Alternatives 2, 4-II, and 7 because the entire flow would be transferred to Punta Bandera for coastal discharge.

Water Quality

To comply with the objectives of Table B of the 2001 California Ocean Plan, the point of exposure for receptor organisms is the edge of a permitted 100:1 dilution contour as parameters are allowed to exceed water quality criteria inside the mixing zone. Exposure values for the risk evaluation, listed in Table 4, reflect average and daily maximum concentrations for the three levels of treatment in Table 2, adjusted for a 100:1 allowable dilution. Treatment levels apply as follows:

- Advanced primary treatment at the SBIWTP (Alternative 1 Options A and B).
- Secondary treatment in aerated lagoon systems at the SBIWTP (Alternative 5 Option A and Alternative 6) or in Mexico (Alternative 4-I).
- Secondary treatment in activated sludge systems at the SBIWTP or the South Bay Water Reclamation Plant (Alternative 5 Option B or Alternative 3, respectively).

Sediment Quality

The characterization of SBOO solids was evaluated for the 1998 SBIWTP treatment options assessment for the three treatment levels now under consideration: advanced primary, secondary in completely mixed aerated lagoons, and secondary in activated sludge systems (CH2M Hill 1998: Table D-2). Table 5 shows this characterization, by potential COC, as it applies to water quality compliance alternatives. Concentrations were calculated on the basis of a 350 mg/L average concentration of total suspended solids (TSS) in the untreated influent wastewater.

Unlike the 1998 evaluation, which considered a constant SBOO flow of 25 mgd, discharge alternatives now under consideration include flow regimes ranging from discontinued SBOO operation to a discharge of 59 mgd. Under these conditions, differences in the extent of exposure of benthic communities among alternatives would be associated by sediment quality and with the magnitude of the solids load. Table 6 lists loads by alternative on a percent basis relative to current discharge conditions (88 mg/L for 25 mgd of advanced primary effluent). For Alternatives 3 and 5B, the solids load from activated sludge systems would represent from 5 to 24 percent of the current discharge. For Alternative 5A, aerated pond systems would release a solids load equivalent of 24 percent of the No Action Alternative load. For Alternatives 4-I and 6, the expected solids load would increase over time with flow increases. Estimated load values are 38 and 56 percent for 2009 to 2023 conditions, respectively, relative to the No Action Alternative load.

3.3 Water Quality at the United States/Mexico Border

Punta Bandera Discharges

Expected discharge composition at Punta Bandera is listed in Table 7 for 2009 and in Table 8 for 2023. The discharge would be a combination of four components that would vary in flow and treatment levels as follows:

- Secondary effluent from aerated pond systems in Tijuana, under consideration for Alternative 4 (up to 59 mgd).
- A constant 25-mgd discharge of effluent from facultative lagoons now in operation at the San Antonio de los Buenos treatment plant.
- Advanced primary effluent routed to Punta Bandera from the SBIWTP (from 11 to 25 mgd).
- Untreated sewage, with flow increasing up to 56 mgd by 2023.

At the United States/Mexico border, the Punta Bandera discharge would be diluted to various degrees as it is transported by coastal and shoreline currents. Table 9 lists monthly dilution factors calculated for a 5-year simulation period by the ocean transport model (Parsons, 2004: Appendix F). Data are applicable to coastal Station S4 located at the border. Dilution factors vary widely each month with changes in prevailing current regimes.

Simulation data for September, which has the lowest potential dilution, were selected as the most critical for risk evaluation (Table 9). Expected concentrations of potential contaminants of concern at the border, calculated on the basis of critical dilution, are listed in Table 10 for 2009 conditions and in Table 11 for 2023 conditions.

Tijuana River

Tijuana River biota would be exposed to untreated wastewater contaminants under Alternative 1 Option A due to releases of up to 9 mgd by 2023. The most critical exposure condition, adopted for the risk assessment, occurs during dry-weather flow conditions, when no dilution flows are available. For this exposure scenario, the undiluted wastewater COC concentrations shown in Table 2 apply.

4.0 Effects Characterization

Table 12 lists the reference values used in the risk evaluation calculations for ocean water, freshwater and sediments.

4.1 Characterization of Ocean Water

The applicable water quality criteria for the South Bay, at the SBOO discharge and at the border, are the 2001 California Ocean Plan objectives for protecting marine aquatic life. Two criteria, the 6-month median and daily maximum limits, were used in the risk assessment for the long-term average and maximum values (Table 12). The potential COC are those screened in Section 2.3.

Average concentrations are likely to be a less critical than daily maximum concentrations in terms of the 2001 California Ocean Plan because compliance is based on a 6-month median. Dilution conditions throughout a 6-month period are expected to substantially exceed the lowest dilution month used in the risk evaluation (Table 9).

4.2 TIJUANA RIVER CHARACTERIZATION

USEPA water quality criteria for protecting freshwater organisms were used in the risk evaluation of untreated wastewater discharges into the Tijuana River (Alternative 1 Option A). Acute exposure values would apply to intermittent releases into the dry river bed, while more stringent chronic values would apply to discharges under continuous flow conditions.

4.3 SEDIMENT QUALITY

Sediment deposition in the SBOO vicinity was evaluated using reference criteria developed by Long, et al. (1995) for marine sediments. Those criteria identify a range of potential adverse effects on sediment-associated organisms for individual COC based on multiple studies on sediment chemistry, bioassays, toxicity tests, and benthic community composition analysis. Two reference values are listed:

- *Effects Range-Low*, below which moderate or no adverse effects are anticipated (10th percentile of the observed effects distribution).
- *Effects Range-Median*, representing conditions under which effects are likely (50th percentile of the observed effects distribution).

5.0 RISK CHARACTERIZATION

The risk characterization was based on the exposure conditions described in Section 3 for the alternatives and pathways and reference values listed in Section 4. The ratio of exposure concentrations to reference values, the hazard quotient (HQ, unitless), was used to indicate potential risk to ecological receptors. For a given contaminant of concern, an HQ value greater than 1.0 indicates a potential for adverse effects under a given exposure condition.

5.1 RELEASES AT SBOO

Water Quality

Table 13 lists HQs applicable to the edge of the allowable mixing zone around the SBOO discharge. All calculated HQ values were below 1.0 indicating that, under any alternative under consideration, aquatic organisms would not be at risk from exposure to metals, cyanide, non-chlorinated phenolic compounds, or total HCH. This result is consistent with the ecological risk evaluation findings for the 1998 evaluation of treatment and discharge options for the SBOO (CH2M Hill, 1998: Appendix D).

The advanced primary effluent currently discharged through the SBOO complies with total chlorine requirements. Future compliance with total chlorine residual in the effluent is anticipated for all alternatives, as this is an operational parameter whose concentration is controlled by the treatment facility. Current SBOO effluent, however, does not meet NPDES permit limits for acute toxicity and chronic toxicity. Potential toxicants in the effluent are not known. It is anticipated that under Alternative 1 (both Options A and B) effluent toxicity will continue to exceed allowable values unless additional treatment is provided, and/or toxicants are controlled at the source under an industrial pretreatment program; the initial phase of this program is currently being implemented by the City of Tijuana. For Alternatives 3, 4 (Discharge Option I), 5 (Options A and B) and 6, the other alternatives with SBOO discharges, toxicity removal or reduction to permitted values is anticipated by addition of secondary treatment in combination with implementation of Tijuana's industrial pretreatment program.

Sediment Quality

Table 14 lists HQs calculated for sediments immediately around the SBOO. Near the outfall, HQs for copper, mercury and silver would exceed the value of 1, which indicates an exceedance of a threshold for low effects under all alternatives. Nickel would also exceed this threshold under Alternatives 3 and Alternative 5 Option B. When more likely effect levels are considered, as indicated by the Effects Range-Median criteria, mercury and silver would exceed the HQ of 1 under four alternatives: Alternatives 1 (Option A and B), 3, and 5 (Option B). Potential adverse effects were also reported in the 1998 ecological risk evaluation of the SBOO treatment and discharge options (Appendix D of CH2M Hill, 1998).

The potential risks of sediments would be limited to the solids settling area near the outfall. As Table 14 shows, all alternatives would reduce the solids load relative to current conditions.

5.2 WATER QUALITY AT THE UNITED STATES/MEXICO BORDER

Punta Bandera Discharge

Calculated HQs for exposure of aquatic organisms at coastal Station S4 are listed in Table 15 for 2009 conditions and in Table 16 for 2023 conditions. The evaluation represents exposure under critical dilution conditions for daily average and daily maximum concentrations.

For 2009 exposure conditions, daily average ammonia concentrations would exceed reference values for all alternatives except Alternatives 4 (Discharge Option I) and 6 (Table 15). These exceedances would be based on an assumed critical dilution and no ammonia degradation during effluent transport to the border by shoreline currents. Copper could also have an exceedance under Alternatives 2, 3, and 7. Cyanide would be marginally exceeded under Alternative 4 (Discharge Option II). In Alternative 7, discontinued SBIWTP operation, chromium, nickel and Lindane concentrations at the border could also be exceeded.

For daily maximum concentrations, the number of exceedances for 2009 would be lower than under average conditions (Table 15). Potential exceedances would apply to Alternatives 2, 3, and 7 (ammonia, nickel, chromium, or copper). As described in Section 4.1, daily maximum concentrations are likely to be more critical than average concentrations for the 2001 California Ocean Plan because compliance for average concentrations is based on a 6-month period when dilution conditions are expected to substantially exceed the critical monthly dilution used in the risk evaluation (Table 9).

Under 2023 conditions, the number of parameters potentially exceeded would increase relative to 2009 conditions. Under most alternatives, both daily average and daily maximum concentrations would exceed water quality reference values for chromium, copper, nickel, ammonia, and Lindane (Table 16). Alternatives 1 (Option A) and 4 (Discharge Option II) would only have two exceedances, while none would be expected for Alternatives 4 (Discharge Option I) and 6.

Tijuana River

Table 17 lists the HQs calculated for sewage discharges to the Tijuana River, an exposure scenario applicable only to 2023 conditions under the No Action Alternative (Alternative 1 Option A). Expected concentrations of most parameters selected for the risk evaluation would exceed allowable water quality criteria under both acute and chronic exposures, as indicated by HQ values greater than 1.

5.3 COMPARISON OF ALTERNATIVES ON THE BASIS OF ECOLOGICAL RISK

Table 18 compares the water quality reference values that would be exceeded under the various alternatives. Discharges to the SBOO, Punta Bandera (2009 and 2023 exposure scenarios) and the Tijuana River were considered.

For the SBOO discharge, the risk analysis revealed that no alternative is likely to exceed water quality reference values at the point of exposure (the edge of the allowable mixing zone) for metals, cyanide, non-chlorinated phenolic compounds, or total HCH. In terms of effluent toxicity, no compliance with allowable limits is anticipated for the discharge of advanced primary effluent (Alternative 1). For Alternatives 3, 4 (Discharge Option I), 5 (Options A and B) and 6, a significant reduction or elimination of acute and chronic toxicity is expected due to the addition of secondary treatment in combination with source control in Tijuana. For settled solids in the outfall vicinity, Alternatives 4-I, 5A, and 6 represent the lowest risk for sediment quality and solids load relative to other discharge options, as shown in Table 14.

For Punta Bandera discharges, no water quality indicators would be exceeded under Alternatives 4 (Discharge Option I) and 6 for either 2009 or 2023. For all other alternatives, concentrations of parameters in the risk evaluation would exceed one or more indicators on the basis of the lowest anticipated dilution (late summer conditions), as listed in Table 18.

In the 2009 exposure scenario, one or two reference values would be exceeded at the border for Alternatives 1 (Options A and B), 4 (Discharge Option II) and 5 (Options A and B). Exceedances of 3 or more reference values under critical dilution conditions would apply to Alternatives 2, 3, and 7.

In the 2023 exposure scenario, the number of potential exceedances at the border due to Punta Bandera discharges would increase relative to 2009 conditions. Alternative 4 (Discharge Option II) could exceed 3 reference values, while up to 8 exceedances would be expected under Alternatives 1 (Option B) and 5. Up to 12 would be expected for Alternatives 2, 3, and 7. In Alternative 1 (Option A), 4 reference values would be exceeded due to the Punta Bandera discharge, and multiple exceedances would also occur in the Tijuana River due to sewage discharges across the border.

Overall, Alternatives 4 (Discharge Option I) and 6 are the most favorable for compliance with water quality requirements and expected sediment quality. Both alternatives include secondary treatment at the SBIWTP or at Tijuana or both, with effluent discharge through the SBOO. Alternative 4 (Discharge Option II) (secondary treatment with Punta Bandera discharge) could slightly exceed requirements, at least during low dilution conditions. The remaining alternatives would have a significantly higher potential to exceed water quality reference values than Alternatives 4 and 6.

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Table 1. Effluent Routing by Alternative and Level of Treatment (Average Flows in Million Gallons per Day)

Routing of Tijuana Projected Flow	South Bay Ocean Outfall			Point Loma	Shoreline Discharge at Punta Bandera				Untreated
	Activated Sludge Effluent	Aerated Pond Effluent	Advanced Primary Effluent	Outfall, Adv. Primary Effluent	Aerated Pond Effluent	Facultative Lagoon Effluent	Advanced Primary Effluent	Untreated Release	Release to Tijuana River
2004 flow, 56 mgd									
Alternatives 1-6	-	-	25	-	-	25	-	6	-
Alternative 7	-	-	-	-	-	25	-	31	-
2009 flow, 65 mgd									
Alternative 1A	-	-	25	-	-	25	-	15	-
Alternative 1B	-	-	25	-	-	25	-	15	-
Alternative 2	-	-	-	-	-	25	25	15	-
Alternative 3	0 - 5*	-	-	9 - 14*	-	25	11	15	-
Alternative 4-I	-	40	-	-	-	25	-	-	-
Alternative 4-II	-	-	-	-	40	25	-	-	-
Alternative 5A	-	25	-	-	-	25	-	15	-
Alternative 5B	25	-	-	-	-	25	-	15	-
Alternative 6	-	40	-	-		25	-	-	-
Alternative 7	-	-	-	-	-	25	-	40	-
2023 Flow, 84 mgd									
Alternative 1A	-	-	25	-	-	25	-	25	9
Alternative 1B	-	-	25	-	-	25	-	34	-
Alternative 2	-	-	-	-	-	25	25	34	-
Alternative 3	0 - 5*	-	-	9 - 14*	-	25	11	34	-
Alternative 4-I	-	59	-	-	-	25	-	-	-
Alternative 4-II	-	-	-	-	59	25	-	-	-
Alternative 5A	-	25	-	-	-	25	-	34	-
Alternative 5B	25	-	-	-	-	25	-	34	-
Alternative 6	-	59	-	-	-	25	-	-	-
Alternative 7	-	-	-	-	-	25	-	59	-

25 Highlated values indicate treatment at the SBIWTP, either primary, or primary and up to 25 mgd of secondary treatment.

* Out of 14 mgd that would be routed to City of San Diego installations, up to 5 mgd could receive secondary treatment at the South Bay Water Reclamation Plant and released through SBOO.

Table 2. April 2001 to March 2003 Characterization of the SBIWTP Influent Wastewater and Treated Primary Effluent

	Daily Average (24 Month Average)*			Daily Maximum (Over 24 Month Period)*	
Parameter	**Influent (ug/L)**	**Effluent (ug/L)**	**Removal Efficiency**	**Influent (ug/L)**	**Effluent (ug/L)**
Arsenic	3.28	1.87	43.0%	9.8	9.3
Cadmium	1.2	0.104	n/a	4.2	2.5
Chromium	96.2	14.1	85.3%	289	59.0
Copper	258	79.1	69.3%	942	565
Lead	22.10	0.000	100.0%	88.3	0.000
Mercury	0.143	0.083	41.7%	2.5	2.0
Nickel	156	66.0	57.7%	1003	270
Selenium	1.75	0.000	100%	3.97	0.000
Silver	4.84	0.135	97.2%	19.0	3.25
Zinc	376	103	72.6%	948	250
Cyanide	22.5	20.3	9.8%	80.0	27.5
Phenolic Compounds (non-chlorinated)	28.8	3.3	88.5%	100	27.7
Ammonia (as N)	30,600	57,200	n/a	46,800	74,200
Total HCH (Lindane)	0.16	<0.001	100%	0.37	<0.001
Chlorinated Phenolics	<6.1	<0.001	n/a	<0.01	<0.001
Endosulfan	<0.02	<0.001	n/a	<0.01	<0.001
Endrin	<0.03	<0.001	n/a	<0.01	<0.001

Influent values from the 1995-1996 emergency connection Tijuana wastewater characterization study (GDC, 1997, Table A4.2).

* Calculated from monthly average and maximum concentrations for the South Bay International Treatment Plant as listed in monthly NPDES permit monitoring reports.

n/a Not applicable.

Table 3. Anticipated Effluent Quality by Treatment Level

	Concentration by Treatment Level (ug/L)*					Removal Efficiency		
	Untreated Wastewater (Table 2)	Primary Effluent (Table 2)	Facultative Lagoons	C. Mixed Aerated Ponds	Activated Sludge Systems	Facultative Lagoons**	C. Mixed Aerated Ponds**	Activated Sludge Systems***
DAILY AVERAGE								
Arsenic	3.28	1.87	3.28	1.81	1.80	0.0%	44.8%	45%
Cadmium	1.200	0.104	0.20	0.08	0.17	83.3%	93.3%	86%
Chromium	96.2	14.1	14.7	3.62	24.05	84.7%	96.2%	75%
Copper	258	79.1	42.0	7.57	36.12	83.7%	97.1%	86%
Lead	22.1	0.0	2.02	1.83	8.62	90.9%	91.7%	61%
Mercury	0.143	0.083	0.03	0.01	0.06	81.3%	91.7%	60%
Nickel	156	66	54.3	37.0	90.5	65.2%	76.3%	42%
Selenium	1.75	0.0	0.50	0.50	1.75	71.3%	71.3%	0%
Silver	4.84	0.135	0.81	0.25	1.21	83.3%	94.8%	75%
Zinc	376	103	58.1	16.5	75.2	84.6%	95.6%	80%
Cyanide	22.5	20.3	22.5	22.5	6.98	0%	0%	69%
Non-Chlorinated Phenolic Compounds	28.8	3.3	2.9	2.9	2.88	90%	90%	90%
Ammonia (as N)	30,600	57,200	30,600	30,600	30,600	0%	0%	0%
Total HCH (Lindane)	0.160	0.000	0.024	0.024	0.077	85.0%	85.0%	52%
DAILY MAXIMUM								
Arsenic	9.8	9.3	9.80	5.41	5.39			
Cadmium	4.2	2.5	0.70	0.28	0.59			
Chromium	289	59	44.1	10.9	72.3			
Copper	942	565	153.2	27.6	131.9			
Lead	88.3	0.0	8.1	7.3	34.4			
Mercury	2.5	2.0	0.47	0.21	1.00			
Nickel	1003	270	348.9	237.7	581.7			
Selenium	3.97	0.0	1.14	1.14	3.97			
Silver	19	3.25	3.17	0.98	4.75			
Zinc	948	250	146	41.6	190			
Cyanide	80	27.5	80	80	25			
Non-Chlorinated Phenolic Compounds	100	27.7	10	10	10			
Ammonia (as N)	46,800	74,200	46,800	46,800	46,800			
Total HCH (Lindane)	0.370	0.000	0.056	0.056	0.178			

* Data for untreated wastewater and primary effluent from SBIWTP data as previously presented in Table 2. For other treatment levels, removal efficiencies were applied to untreated wastewater concentrations.

** Metals removal data based on design data for the CMA pond system at Hofer site, as presented in the evaluation of SBIWTP long-term treatment options (CH2M-Hill, 1998b: Appendix B3, Table 16). Effluent data for the anaerobic zone of the CMA system was used as representative of a facultative lagoon treatment system. Removal rates for non-chlorinated phenols and HCH as reported for CMA pond systems in the SBOO effluent discharge and dispersion study (GDC, 1997: Table 5.7A).

*** Removal efficiency data from SBOO effluent discharge and dispersion study (GDC, 1997: Table 5.7A).

Table 4. SBOO Water Quality at the Edge of Mixing Zone (100:1 Dilution)

	Alt. 1A	Alt. 1B	Alt. 3	Alt. 4-I	Alt. 5A	Alt. 5B	Alt. 6
	Advanced Primary	Advanced Primary	Activated Sludge	Aerated Ponds	Aerated Ponds	Activated Sludge	Aerated Ponds
Parameter	**Daily Average Concentration (ug/L)**						
Arsenic*	2.99	2.99	2.99	2.99	2.99	2.99	2.99
Cadmium	0.0010	0.0010	0.0017	0.0008	0.0008	0.0017	0.0008
Chromium	0.141	0.141	0.241	0.036	0.036	0.241	0.036
Copper*	2.77	2.77	2.34	2.06	2.06	2.34	2.06
Lead	0.000	0.000	0.086	0.018	0.018	0.086	0.018
Mercury*	0.0013	0.0013	0.0011	0.0006	0.0006	0.0011	0.0006
Nickel	0.660	0.660	0.905	0.370	0.370	0.905	0.370
Selenium	0.000	0.000	0.018	0.005	0.005	0.018	0.005
Silver*	0.160	0.160	0.171	0.161	0.161	0.171	0.161
Zinc*	8.95	8.95	8.67	8.09	8.09	8.67	8.09
Cyanide	0.203	0.203	0.070	0.225	0.225	0.070	0.225
Non-Chlorinated Phenolic Compounds	0.033	0.033	0.029	0.029	0.029	0.029	0.029
Ammonia (as N)	572	572	306	306	306	306	306
Total HCH (Lindane)	0.00000	0.00000	0.00077	0.00024	0.00024	0.00077	0.00024
Parameter	**Daily Maximum Concentration (ug/L)**						
Arsenic*	3.06	3.06	3.02	3.02	3.02	3.02	3.02
Cadmium	0.0250	0.0250	0.0059	0.0028	0.0028	0.0059	0.0028
Chromium	0.590	0.590	0.723	0.109	0.109	0.723	0.109
Copper*	7.63	7.63	3.30	2.26	2.26	3.30	2.26
Lead	0.00	0.00	0.344	0.073	0.073	0.344	0.073
Mercury*	0.0205	0.0205	0.0105	0.0026	0.0026	0.0105	0.0026
Nickel	2.70	2.70	5.82	2.38	2.38	5.82	2.38
Selenium	0.00	0.00	0.040	0.011	0.011	0.040	0.011
Silver*	0.191	0.191	0.206	0.168	0.168	0.206	0.168
Zinc*	10.4	10.4	9.8	8.3	8.3	9.8	8.3
Cyanide	0.275	0.275	0.248	0.800	0.800	0.248	0.800
Non-Chlorinated Phenolic Compounds	0.277	0.277	0.100	0.10	0.10	0.100	0.10
Ammonia (as N)	742	742	468	468	468	468	468
Total HCH (Lindane)	0.00000	0.00000	0.00178	0.00056	0.00056	0.00178	0.00056

* Dilutions based on the following background values specified by the California Ocean Plan:
arsenic, 3 ug/l; copper, 2 ug/l; mercury, 0.0005 ug/l; silver, 0.16 ug/l; and zinc, 8 ug/l.

Table 5. Sediment Quality for SBOO Discharge (Adapted from CH2M Hill, 1998: Table D-2)

Parameter	Alt. 1A Advanced Primary	Alts. 1B Advanced Primary	Alt. 3 Activated Sludge	Alt. 4-I CM Aerated Ponds	Alt. 5A CM Aerated Ponds	Alt. 5B Activated Sludge	Alt. 6 CM Aerated Ponds
	Sediment Concentration (mg/kg Dry Weight)						
Arsenic	0.05	0.05	0.12	0.12	0.12	0.12	0.12
Cadmium	0.07	0.07	0.05	0.02	0.02	0.05	0.02
Chromium	3.72	3.72	2.80	0.80	0.80	2.80	0.80
Copper	226	226	170	36	36	170	36
Lead	6.6	6.6	25.0	5.2	5.2	25.0	5.2
Mercury	0.81	0.81	1.51	0.31	0.31	1.51	0.31
Nickel	9.0	9.0	25.5	10.4	10.4	25.5	10.4
Selenium	0.01	0.01	0.03	0.05	0.05	0.03	0.05
Silver	9.0	9.0	12.1	2.4	2.4	12.1	2.4
Zinc	110	110	127	27.8	27.8	127	27.8
Total HCH (Lindane)	0.41	0.41	0.26	0.19	0.19	0.26	0.19

Table 6. Solids Load for SBOO Discharge

	Alt. 1A	Alts. 1B	Alt. 3	Alt. 4-I	Alt. 5A	Alt. 5B	Alt. 6
2009 Conditions							
Total suspended solids (mg/L)	88	88	21	21	21	21	21
Effluent flow (mgd)	25	25	5	40	25	25	40
Solids load (kg/d)	8,327	8,327	397	3,179	1,987	1,987	3,179
Solids load relative to Alternative 1A	100%	100%	5%	38%	24%	24%	38%
2023 Conditions							
Total suspended solids (mg/L)	88	88	21	21	21	21	21
Effluent flow (mgd)	25	25	5	59	25	25	59
Solids load (kg/d)	8,327	8,327	397	4,690	1,987	1,987	4,690
Solids load relative to Alternative 1A	100%	100%	5%	56%	24%	24%	56%

Table 7. 2009 Effluent Concentration at Punta Bandera Shoreline Discharge

	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
	40 mgd	40 mgd	65 mgd	51 mgd	25 mgd	65 mgd	40 mgd	40 mgd	25 mgd	65 mgd
Component	**Discharge Composition by Volume**									
CMA Aerated Pond Effluent						61.5%				
Facultative Lagoon Effluent	62.5%	62.5%	38.5%	49.0%	100.0%	38.5%	62.5%	62.5%	100.0%	38.5%
Advanced Primary Effluent			38.5%	21.6%						
Untreated Wastewater	37.5%	37.5%	23.1%	29.4%			37.5%	37.5%		61.5%
Parameter	**Daily Average Concentration (ug/L)**									
Arsenic*	3.28	3.28	2.74	2.98	3.28	2.38	3.28	3.28	3.28	3.28
Cadmium	0.58	0.58	0.39	0.47	0.20	0.13	0.58	0.58	0.20	0.82
Chromium	45.2	45.2	33.3	38.5	14.7	7.9	45.2	45.2	14.7	64.8
Copper*	123	123	106	114	42.0	20.8	123	123	42.0	175
Lead	9.6	9.6	5.9	7.5	2.0	1.9	9.6	9.6	2.0	14.4
Mercury*	0.070	0.070	0.075	0.073	0.027	0.018	0.070	0.070	0.027	0.098
Nickel	92.4	92.4	82.3	86.7	54.3	43.6	92.4	92.4	54.3	116.9
Selenium	0.97	0.97	0.60	0.76	0.50	0.50	0.97	0.97	0.50	1.27
Silver*	2.32	2.32	1.48	1.85	0.81	0.46	2.32	2.32	0.81	3.29
Zinc*	177	177	149	161	58	32	177	177	58	254
Cyanide	22.5	22.5	21.7	22.0	22.5	22.5	22.5	22.5	22.5	22.5
Non-Chlorinated Phenolic Compounds	12.6	12.6	9.0	10.6	2.9	2.9	12.6	12.6	2.9	18.8
Ammonia (as N)	30,600	30,600	40,831	36,337	30,600	30,600	30,600	30,600	30,600	30,600
Total HCH (Lindane)	0.075	0.075	0.046	0.059	0.024	0.024	0.075	0.075	0.024	0.108
Parameter	**Daily Maximum Concentration (ug/L)**									
Arsenic*	9.80	9.80	9.61	9.69	9.80	7.10	9.80	9.80	9.80	9.80
Cadmium	2.01	2.01	2.20	2.12	0.70	0.44	2.01	2.01	0.70	2.85
Chromium	136	136	106	119	44.1	23.6	136	136	44.1	195
Copper*	449	449	494	474	153	76	449	449	153.2	639
Lead	38.2	38.2	23.5	29.9	8.1	7.6	38.2	38.2	8.1	57.4
Mercury*	1.23	1.23	1.53	1.40	0.47	0.31	1.23	1.23	0.47	1.72
Nickel	594	594	469	524	349	280	594	594	349	751
Selenium	2.20	2.20	1.35	1.73	1.14	1.14	2.20	2.20	1.14	2.88
Silver*	9.1	9.1	6.85	7.8	3.17	1.82	9.1	9.1	3.17	12.9
Zinc*	447	447	371	405	146	82	447	447	146	640
Cyanide	80.0	80.0	59.8	68.7	80.0	80.0	80.0	80.0	80.0	80.0
Non-Chlorinated Phenolic Compounds	44	44	38	40	10	10	44	44	10	65
Ammonia (as N)	46,800	46,800	57,338	52,710	46,800	46,800	46,800	46,800	46,800	46,800
Total HCH (Lindane)	0.173	0.173	0.107	0.136	0.056	0.056	0.173	0.173	0.056	0.249

Table 8. 2023 Effluent Concentration at Punta Bandera Shoreline Discharge

	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
	50 mgd	59 mgd	84 mgd	70 mgd	25 mgd	84 mgd	59 mgd	59 mgd	25 mgd	84 mgd
Component	**Discharge Composition by Volume**									
C.M. Aerated Pond Effluent						70.2%				
Facultative Lagoon Effluent	50.0%	42.4%	29.8%	35.7%	100.0%	29.8%	42.4%	42.4%	100.0%	29.8%
Advanced Primary Effluent			29.8%	15.7%						
Untreated Wastewater	50.0%	57.6%	40.5%	48.6%			57.6%	57.6%		70.2%
Parameter	**Daily Average Concentration (ug/L)**									
Arsenic	3.28	3.28	2.86	3.06	3.28	2.25	3.28	3.28	3.28	3.28
Cadmium	0.70	0.78	0.58	0.67	0.20	0.12	0.78	0.78	0.20	0.90
Chromium	55.4	61.7	47.5	54.2	14.7	6.9	61.7	61.7	14.7	71.9
Copper	150	166	140	153	42.0	17.8	166	166	42.0	194
Lead	12.1	13.6	9.5	11.5	2.0	1.9	13.6	13.6	2.0	16.1
Mercury	0.085	0.094	0.091	0.092	0.027	0.016	0.094	0.094	0.027	0.108
Nickel	105.1	112.9	98.9	105.5	54.3	42.1	112.9	112.9	54.3	125.7
Selenium	1.13	1.22	0.86	1.03	0.50	0.50	1.22	1.22	0.50	1.38
Silver	2.82	3.13	2.24	2.66	0.81	0.42	3.13	3.13	0.81	3.64
Zinc	217	241	200	220	58	29	241	241	58	281
Cyanide	22.5	22.5	21.8	22.2	22.5	22.5	22.5	22.5	22.5	22.5
Non-Chlorinated Phenolic Compounds	15.8	17.8	13.5	15.5	2.9	2.9	17.8	17.8	2.9	21.1
Ammonia (as N)	30,600	30,600	38,517	34,780	30,600	30,600	30,600	30,600	30,600	30,600
Total HCH (Lindane)	0.092	0.102	0.072	0.086	0.024	0.024	0.102	0.102	0.024	0.120
Parameter	**Daily Maximum Concentration (ug/L)**									
Arsenic	9.80	9.80	9.65	9.72	9.80	6.72	9.80	9.80	9.80	9.80
Cadmium	2.45	2.72	2.65	2.68	0.70	0.41	2.72	2.72	0.70	3.16
Chromium	167	185	148	165	44.1	20.7	185	185	44.1	216
Copper	548	608	595	601	153	65	608	608	153.2	707
Lead	48.2	54.3	38.1	45.8	8.1	7.5	54.3	54.3	8.1	64.4
Mercury	1.48	1.64	1.75	1.70	0.47	0.28	1.64	1.64	0.47	1.89
Nickel	676	726	590	654	349	271	726	726	349	808
Selenium	2.56	2.77	1.95	2.34	1.14	1.14	2.77	2.77	1.14	3.13
Silver	11.1	12.3	9.60	10.9	3.17	1.63	12.3	12.3	3.17	14.3
Zinc	547	608	502	552	146	73	608	608	146	709
Cyanide	80.0	80.0	64.4	71.8	80.0	80.0	80.0	80.0	80.0	80.0
Non-Chlorinated Phenolic Compounds	55	62	52	56	10	10	62	62	10	73
Ammonia (as N)	46,800	46,800	54,955	51,106	46,800	46,800	46,800	46,800	46,800	46,800
Total HCH (Lindane)	0.213	0.237	0.166	0.200	0.056	0.056	0.237	0.237	0.056	0.276

Table 9. Dilution Factors for Punta Bandera Discharge Based on 5-Year Simulation Results (Coastal Station S4 at the United States/Mexico Border)

	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
2009 Flows	40 mgd	40 mgd	65 mgd	51 mgd	25 mgd	65 mgd	40 mgd	40 mgd	25 mgd	65 mgd
2023 Flows	50 mgd	59 mgd	84 mgd	70 mgd	25 mgd	84 mgd	59 mgd	59 mgd	25 mgd	84 mgd

Year 2009	Dilution Factors (volumen for dilution of one unit volume of effluent)									
January	137,931	137,931	38,388	104,712	1,666,667	38,388	137,931	137,931	1,666,667	38,388
February	173.0	173.0	78.3	98.4	210.5	78.3	173.0	173.0	210.5	78.3
March	---	---	---	---	---	---	---	---	---	---
April	8,838	8,838	1,334	5,200	13,680	1,334	8,838	8,838	13,680	1,334
May	92,593	92,593	13,746	26,631	138,889	13,746	92,593	92,593	138,889	13,746
June	69.6	69.6	32.5	41.8	84.3	32.5	69.6	69.6	84.3	32.5
July	65.5	65.5	29.5	39.0	79.3	29.5	65.5	65.5	79.3	29.5
August	57.2	57.2	26.1	34.6	69.1	26.1	57.2	57.2	69.1	26.1
September	48.5	48.5	22.1	31.9	58.0	22.1	48.5	48.5	58.0	22.1
October	666.2	666.2	216.4	357.5	865.7	216.4	666.2	666.2	865.7	216.4
November	200.5	200.5	89.6	116.8	242.2	89.6	200.5	200.5	242.2	89.6
December	162.0	162.0	76.4	104.0	195.5	76.4	162.0	162.0	195.5	76.4

Year 2023	Dilution Factors (volumen for dilution of one unit volume of effluent)									
January	104,712	59,524	9,033	28,531	1,666,667	9,033	59,524	59,524	1,666,667	9,033
February	98.4	87.1	53.0	72.7	210.5	53.0	87.1	87.1	210.5	53.0
March	---	---	---	---	---	---	---	---	---	---
April	5,200	1,747	908	1,461	13,680	908	1,747	1,747	13,680	908
May	26,631	17,746	5,739	16,584	138,889	5,739	17,746	17,746	138,889	5,739
June	41.8	36.0	22.0	29.6	84.3	22.0	36.0	36.0	84.3	22.0
July	39.0	32.7	22.4	27.0	79.3	22.4	32.7	32.7	79.3	22.4
August	34.6	28.8	20.3	24.3	69.1	20.3	28.8	28.8	69.1	20.3
September	31.9	24.6	19.5	20.4	58.0	19.5	24.6	24.6	58.0	19.5
October	357.5	253.6	208.1	197.0	865.7	208.1	253.6	253.6	865.7	208.1
November	116.8	99.6	65.4	82.9	242.2	65.4	99.6	99.6	242.2	65.4
December	104.0	83.7	65.1	69.6	195.5	65.1	83.7	83.7	195.5	65.1

Value used as critical dilution in the risk calculations.

* Data from Shore and Ocean Discharge Modeling Report (Parsons 2004: Appendix F).

Table 10. 2009 Water Quality at the USA/Mexico Border (Coastal Station S4)

	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
2009 Average Flow	40 mgd	40 mgd	65 mgd	51 mgd	25 mgd	65 mgd	40 mgd	40 mgd	25 mgd	65 mgd
Critical Dilution	48.5	48.5	22.1	31.9	58.0	22.1	48.5	48.5	58.0	22.1
Effluent Contribution	2.06%	2.06%	4.53%	3.14%	1.72%	4.53%	2.06%	2.06%	1.72%	4.53%

Parameter	**Daily Average Concentration (ug/L)**									
Arsenic*	3.01	3.01	2.99	3.00	3.00	2.97	3.01	3.01	3.00	3.01
Cadmium	0.012	0.012	0.018	0.015	0.003	0.006	0.012	0.012	0.003	0.037
Chromium	0.93	0.93	1.51	1.21	0.25	0.36	0.93	0.93	0.25	2.94
Copper*	4.45	4.45	6.51	5.39	2.68	2.81	4.45	4.45	2.68	9.49
Lead	0.20	0.20	0.27	0.24	0.03	0.09	0.20	0.20	0.03	0.65
Mercury*	0.002	0.002	0.004	0.003	0.001	0.001	0.002	0.002	0.001	0.005
Nickel	1.91	1.91	3.72	2.72	0.94	1.97	1.91	1.91	0.94	5.29
Selenium	0.020	0.020	0.027	0.024	0.009	0.023	0.020	0.020	0.009	0.058
Silver*	0.20	0.20	0.22	0.21	0.17	0.17	0.20	0.20	0.17	0.30
Zinc*	11.4	11.4	14.1	12.7	8.8	9.1	11.4	11.4	8.8	18.6
Cyanide	0.46	0.46	0.98	0.69	0.39	1.02	0.46	0.46	0.39	1.02
Non-Chlorinated Phenolic Compounds	0.26	0.26	0.41	0.33	0.05	0.13	0.26	0.26	0.05	0.85
Ammonia (as N)	632	632	1,849	1,140	528	1,385	632	632	528	1,385
Total HCH (Lindane)	0.0015	0.0015	0.0021	0.0018	0.0004	0.0011	0.0015	0.0015	0.0004	0.0049

Parameter	**Daily Maximum Concentration (ug/L)**									
Arsenic*	3.14	3.14	3.29	3.20	3.12	3.18	3.14	3.14	3.12	3.29
Cadmium	0.042	0.042	0.100	0.066	0.012	0.020	0.042	0.042	0.012	0.129
Chromium	2.81	2.81	4.81	3.75	0.76	1.07	2.81	2.81	0.76	8.82
Copper*	11.0	11.0	23.3	16.4	4.6	5.2	11.0	11.0	4.6	29.6
Lead	0.79	0.79	1.06	0.94	0.14	0.34	0.79	0.79	0.14	2.60
Mercury*	0.025	0.025	0.067	0.043	0.008	0.014	0.025	0.025	0.008	0.075
Nickel	12.3	12.3	21.3	16.5	6.02	12.70	12.3	12.3	6.0	34.0
Selenium	0.045	0.045	0.061	0.054	0.020	0.052	0.045	0.045	0.020	0.130
Silver*	0.341	0.341	0.450	0.394	0.211	0.232	0.341	0.341	0.211	0.712
Zinc*	16.9	16.9	23.7	20.1	10.3	11.2	16.9	16.9	10.3	35.4
Cyanide	1.65	1.65	2.71	2.16	1.38	3.62	1.65	1.65	1.38	3.62
Non-Chlorinated Phenolic Compounds	0.90	0.90	1.70	1.26	0.17	0.45	0.90	0.90	0.17	2.96
Ammonia (as N)	966	966	2,596	1,654	807	2,119	966	966	807	2,119
Total HCH (Lindane)	0.0036	0.0036	0.0048	0.0043	0.0010	0.0025	0.0036	0.0036	0.0010	0.0113

* Dilutions based on the following background values specified by the California Ocean Plan: arsenic, 3 ug/l; copper, 2 ug/l; mercury, 0.0005 ug/l; silver, 0.16 ug/l; and zinc, 8 ug/l.

Table 11. 2023 Water Quality at the USA/Mexico Border (Coastal Station S4)

	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
2023 Average Flow	50 mgd	59 mgd	84 mgd	70 mgd	25 mgd	84 mgd	59 mgd	59 mgd	25 mgd	84 mgd
Critical Dilution	31.9	24.6	19.5	20.4	58.0	19.5	24.6	24.6	58.0	19.5
Effluent Contribution	3.14%	4.06%	5.14%	4.90%	1.72%	5.14%	4.06%	4.06%	1.72%	5.14%

Parameter	Daily Average Concentration (ug/L)									
Arsenic*	3.01	3.01	2.99	3.00	3.00	2.96	3.01	3.01	3.00	3.01
Cadmium	0.022	0.032	0.030	0.033	0.003	0.006	0.032	0.032	0.003	0.046
Chromium	1.74	2.51	2.44	2.65	0.25	0.35	2.51	2.51	0.25	3.70
Copper*	6.50	8.42	8.77	9.04	2.68	2.77	8.42	8.42	2.68	11.4
Lead	0.38	0.55	0.49	0.56	0.03	0.10	0.55	0.55	0.03	0.83
Mercury*	0.0031	0.0041	0.0049	0.0048	0.0009	0.0013	0.0041	0.0041	0.0009	0.0058
Nickel	3.30	4.59	5.08	5.17	0.94	2.16	4.59	4.59	0.94	6.46
Selenium	0.035	0.050	0.044	0.050	0.009	0.026	0.050	0.050	0.009	0.071
Silver*	0.241	0.276	0.262	0.277	0.171	0.172	0.276	0.276	0.171	0.330
Zinc*	14.4	17.1	17.4	17.9	8.8	9.0	17.1	17.1	8.8	21.4
Cyanide	0.71	0.91	1.12	1.09	0.39	1.16	0.91	0.91	0.39	1.16
Non-Chlorinated Phenolic Compounds	0.50	0.72	0.69	0.76	0.05	0.15	0.72	0.72	0.05	1.08
Ammonia (as N)	960	1,244	1,979	1,703	528	1,572	1,244	1,244	528	1,572
Total HCH (Lindane)	0.0029	0.0042	0.0037	0.0042	0.0004	0.0012	0.0042	0.0042	0.0004	0.0061

Parameter	Daily Maximum Concentration (ug/L)									
Arsenic*	3.21	3.27	3.33	3.31	3.12	3.18	3.27	3.27	3.12	3.33
Cadmium	0.077	0.110	0.136	0.131	0.012	0.021	0.110	0.110	0.012	0.162
Chromium	5.23	7.53	7.59	8.10	0.76	1.07	7.53	7.53	0.76	11.10
Copper*	18.6	25.7	31.0	30.0	4.56	5.08	25.7	25.7	4.56	36.5
Lead	1.51	2.21	1.96	2.24	0.14	0.39	2.21	2.21	0.14	3.31
Mercury*	0.0456	0.0645	0.0858	0.0796	0.0084	0.0144	0.0645	0.0645	0.0084	0.0931
Nickel	21.2	29.5	30.3	32.0	6.02	13.91	29.5	29.5	6.0	41.5
Selenium	0.080	0.113	0.100	0.114	0.020	0.059	0.113	0.113	0.020	0.161
Silver*	0.492	0.634	0.621	0.660	0.211	0.232	0.634	0.634	0.211	0.850
Zinc*	24.4	31.4	32.1	33.4	10.3	11.2	31.4	31.4	10.3	42.3
Cyanide	2.51	3.25	3.31	3.51	1.38	4.11	3.25	3.25	1.38	4.11
Non-Chlorinated Phenolic Compounds	1.73	2.51	2.66	2.77	0.17	0.51	2.51	2.51	0.17	3.76
Ammonia (as N)	1,469	1,902	2,823	2,503	807	2,404	1,902	1,902	807	2,404
Total HCH (Lindane)	0.0067	0.0096	0.0085	0.0098	0.0010	0.0029	0.0096	0.0096	0.0010	0.0142

* Dilutions based on the following background values specified by the California Ocean Plan:
arsenic, 3 ug/l; copper, 2 ug/l; mercury, 0.0005 ug/l; silver, 0.16 ug/l; and zinc, 8 ug/l.

Table 12. Reference Values for Water and Sediment Quality

	6-Month Median (ug/L)	Daily Maximum (ug/L)	Acute Exposure (ug/L)	Chronic Exposure (ug/L)	Effects Range Low (mg/kg)	Effects Range Median (mg/kg)
Arsenic	8	32	360	190	8.2	70
Cadmium	1	4	3.9	1.1	1.2	9.6
Chromium	2	8	16	11	81	370
Copper	3	12	18	12	34	270
Lead	2	8	82	3.2	46.7	218
Mercury	0.04	0.16	2.4	N/A	0.15	0.71
Nickel	5	20	1400	160	20.9	51.6
Selenium	15	60	20	5	4	N/A
Silver	0.7	2.8	4.1	N/A	1	3.7
Zinc	20	80	120	110	150	410
Cyanide	1	4	22	5.2	N/A	N/A
Non-Chlorinated Phenolic Compounds	30	120	N/A	N/A	N/A	N/A
Ammonia (as N)	600	2400	-	-	N/A	N/A
Total HCH (Lindane)	0.004	0.008	2	0.08	N/A	N/A

N/A Not available.

* California Ocean Plan, Table B: Ojectives for protection of marine aquatic life.
** USEPA water quality criteria for protection of freshwater biota. Ammonia criteria is pH and temperature dependent, and was not included in the risk assessment.
*** Effects levels from Long et al. (1995). Selenium value is a No Observed Adverse Effect Level from EPA (1996).

Table 13. Hazard Quotient at the Edge of the SBOO Mixing Zone

Parameter	2001 Ocean Plan Criteria (ug/L)	Alt. 1A Advanced Primary	Alt. 1B Advanced Primary	Alt. 3 Activated Sludge	Alt. 4-I Aerated Lagoons	Alt. 5A Aerated Lagoons	Alt. 5B Activated Sludge	Alt. 6 Aerated Lagoons
		Hazard Quotient for Daily Average Concentration (unitless)						
Arsenic	8	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Cadmium	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	2	0.07	0.07	0.12	0.02	0.02	0.12	0.02
Copper	3	0.92*	0.92*	0.78	0.69	0.69	0.78	0.69
Lead	2	0.00	0.00	0.04	0.01	0.01	0.04	0.01
Mercury	0.04	0.03	0.03	0.03	0.02	0.02	0.03	0.02
Nickel	5	0.13	0.13	0.18	0.07	0.07	0.18	0.07
Selenium	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silver	0.7	0.23	0.23	0.24	0.23	0.23	0.24	0.23
Zinc	20	0.45	0.45	0.43	0.40	0.40	0.43	0.40
Cyanide	1	0.20	0.20	0.07	0.23	0.23	0.07	0.23
Non-Chlorinated Phenolic Compounds	30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonia (as N)	600	0.95*	0.95*	0.51	0.51	0.51	0.51	0.51
Total HCH (Lindane)	0.004	0.00	0.00	0.19	0.06	0.06	0.19	0.06

* While HQ values are below 1.0, criteria exceedances have been reported for ammonia and, to a lesser extent, for copper (SAIC, 2004).

Parameter	2001 Ocean Plan Criteria (ug/L)	Alt. 1A Advanced Primary	Alt. 1B Advanced Primary	Alt. 3 Activated Sludge	Alt. 4-I Aerated Lagoons	Alt. 5A Aerated Lagoons	Alt. 5B Activated Sludge	Alt. 6 Aerated Lagoons
		Hazard Quotient for Daily Maximum Concentration (unitless)						
Arsenic	32	0.10	0.10	0.09	0.09	0.09	0.09	0.09
Cadmium	4	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Chromium	8	0.07	0.07	0.09	0.01	0.01	0.09	0.01
Copper	12	0.64	0.64	0.27	0.19	0.19	0.27	0.19
Lead	8	0.00	0.00	0.04	0.01	0.01	0.04	0.01
Mercury	0.16	0.13	0.13	0.07	0.02	0.02	0.07	0.02
Nickel	20	0.14	0.14	0.29	0.12	0.12	0.29	0.12
Selenium	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silver	2.8	0.07	0.07	0.07	0.06	0.06	0.07	0.06
Zinc	80	0.13	0.13	0.12	0.10	0.10	0.12	0.10
Cyanide	4	0.07	0.07	0.06	0.20	0.20	0.06	0.20
Non-Chlorinated Phenolic Compounds	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonia (as N)	2400	0.31	0.31	0.20	0.20	0.20	0.20	0.20
Total HCH (Lindane)	0.008	0.00	0.00	0.22	0.07	0.07	0.22	0.07

1.0 HQ values greater than 1.0 indicate a potential for adverse effects.

Table 14. Hazard Quotient for Sediments at the SBOO Discharge

	Alt. 1A	Alts. 1B	Alt. 3	Alt. 4-I	Alt. 5A	Alt. 5B	Alt. 6
	Advanced Primary	Advanced Primary	Activated Sludge	CMA Lagoons	CMA Lagoons	Activated Sludge	CMA Lagoons
	Solids Load Relative to Alternative 1A (No Action Alt.)						
Year 2009	100%	100%	5%	38%	24%	24%	38%
Year 2023	100%	100%	5%	56%	24%	24%	56%

Parameter	***Guideline (mg/kg)***	**Hazard Quotient for Effects Range-Low (unitless)**						
Arsenic	*8.2*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	*1.2*	0.06	0.06	0.04	0.02	0.02	0.04	0.02
Chromium	*81*	0.05	0.05	0.03	0.01	0.01	0.03	0.01
Copper	*34*	6.6	6.6	5.0	1.0	1.0	5.0	1.0
Lead	*47*	0.14	0.14	0.53	0.11	0.11	0.53	0.11
Mercury	*0.15*	5.4	5.4	10.1	2.1	2.1	10.1	2.1
Nickel	*20.9*	0.43	0.43	1.22	0.50	0.50	1.22	0.50
Selenium	*4*	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Silver	*1*	9.0	9.0	12.1	2.4	2.4	12.1	2.4
Zinc	*150*	0.73	0.73	0.85	0.19	0.19	0.85	0.19

Parameter	***Guideline (mg/kg)***	**Hazard Quotient for Effects Range-Median (unitless)**						
Arsenic	*70*	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	*9.6*	0.01	0.01	0.01	0.00	0.00	0.01	0.00
Chromium	*370*	0.01	0.01	0.01	0.00	0.00	0.01	0.00
Copper	*270*	0.84	0.84	0.63	0.13	0.13	0.63	0.13
Lead	*218*	0.03	0.03	0.11	0.02	0.02	0.11	0.02
Mercury	*0.71*	1.14	1.14	2.13	0.44	0.44	2.13	0.44
Nickel	*51.6*	0.17	0.17	0.49	0.20	0.20	0.49	0.20
Selenium	*n/a*							
Silver	*3.7*	2.43	2.43	3.27	0.65	0.65	3.27	0.65
Zinc	*410*	0.27	0.27	0.31	0.07	0.07	0.31	0.07

1.0 HQ values greater than 1.0 indicate a potential for adverse effects.

Table 15. Hazard Quotient at the USA/Mexico Border (Coastal Station S4) for 2009 Conditions

		Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
		40 mgd	40 mgd	65 mgd	51 mgd	25 mgd	65 mgd	40 mgd	40 mgd	25 mgd	65 mgd
Parameter	***2001 Ocean Plan Criteria (ug/L)***	**Hazard Quotient for Daily Average Concentration (unitless)**									
Arsenic	*8*	0.38	0.38	0.37	0.37	0.38	0.37	0.38	0.38	0.38	0.38
Cadmium	*1*	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.01	0.00	0.04
Chromium	*2*	0.47	0.47	0.75	0.60	0.13	0.18	0.47	0.47	0.13	1.47
Copper	*3*	1.48	1.48	2.17	1.80	0.89	0.94	1.48	1.48	0.89	3.16
Lead	*2*	0.10	0.10	0.13	0.12	0.02	0.04	0.10	0.10	0.02	0.33
Mercury	*0.04*	0.05	0.05	0.09	0.07	0.02	0.03	0.05	0.05	0.02	0.12
Nickel	*5*	0.38	0.38	0.74	0.54	0.19	0.39	0.38	0.38	0.19	1.06
Selenium	*15*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silver	*0.7*	0.29	0.29	0.31	0.30	0.24	0.25	0.29	0.29	0.24	0.42
Zinc	*20*	0.57	0.57	0.70	0.63	0.44	0.45	0.57	0.57	0.44	0.93
Cyanide	*1*	0.46	0.46	0.98	0.69	0.39	1.02	0.46	0.46	0.39	1.02
Phenolic Compounds	*30*	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.03
Ammonia (as N)	*600*	1.05	1.05	3.08	1.90	0.88	2.31	1.05	1.05	0.88	2.31
Total HCH (Lindane)	*0.004*	0.39	0.39	0.52	0.46	0.10	0.27	0.39	0.39	0.10	1.22
Parameter	***2001 Ocean Plan Criteria (ug/L)***	**Hazard Quotient for Daily Maximum Concentration (unitless)**									
Arsenic	*32*	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Cadmium	*4*	0.01	0.01	0.02	0.02	0.00	0.00	0.01	0.01	0.00	0.03
Chromium	*8*	0.35	0.35	0.60	0.47	0.10	0.13	0.35	0.35	0.10	1.10
Copper	*12*	0.92	0.92	1.94	1.36	0.38	0.43	0.92	0.92	0.38	2.46
Lead	*8*	0.10	0.10	0.13	0.12	0.02	0.04	0.10	0.10	0.02	0.33
Mercury	*0.16*	0.16	0.16	0.42	0.27	0.05	0.09	0.16	0.16	0.05	0.47
Nickel	*20*	0.61	0.61	1.06	0.82	0.30	0.63	0.61	0.61	0.30	1.70
Selenium	*15*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Silver	*2.8*	0.12	0.12	0.16	0.14	0.08	0.08	0.12	0.12	0.08	0.25
Zinc	*80*	0.21	0.21	0.30	0.25	0.13	0.14	0.21	0.21	0.13	0.44
Cyanide	*4*	0.41	0.41	0.68	0.54	0.34	0.91	0.41	0.41	0.34	0.91
Phenolic Compounds	*120*	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.02
Ammonia (as N)	*2400*	0.40	0.40	1.08	0.69	0.34	0.88	0.40	0.40	0.34	0.88
Total HCH (Lindane)	*0.008*	0.45	0.45	0.60	0.53	0.12	0.31	0.45	0.45	0.12	1.41

1.0 HQ values greater than 1.0 indicate a potential for adverse effects.

Table 16. Hazard Quotient at the USA/Mexico Border (Coastal Station S4) for 2023 Conditions

Parameter	2001 Ocean Plan Criteria (ug/L)	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
		50 mgd	59 mgd	84 mgd	70 mgd	25 mgd	84 mgd	59 mgd	59 mgd	25 mgd	84 mgd
		Hazard Quotient for Daily Average Concentration (unitless)									
Arsenic	*8*	0.38	0.38	0.37	0.38	0.38	0.37	0.38	0.38	0.38	0.38
Cadmium	*1*	0.02	0.03	0.03	0.03	0.00	0.01	0.03	0.03	0.00	0.05
Chromium	*2*	0.87	1.25	1.22	1.33	0.13	0.18	1.25	1.25	0.13	1.85
Copper	*3*	2.17	2.81	2.92	3.01	0.89	0.92	2.81	2.81	0.89	3.79
Lead	*2*	0.19	0.28	0.25	0.28	0.02	0.05	0.28	0.28	0.02	0.41
Mercury	*0.04*	0.08	0.10	0.12	0.12	0.02	0.03	0.10	0.10	0.02	0.14
Nickel	*5*	0.66	0.92	1.02	1.03	0.19	0.43	0.92	0.92	0.19	1.29
Selenium	*15*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silver	*0.7*	0.34	0.39	0.37	0.40	0.24	0.25	0.39	0.39	0.24	0.47
Zinc	*20*	0.72	0.86	0.87	0.89	0.44	0.45	0.86	0.86	0.44	1.07
Cyanide	*1*	0.71	0.91	1.12	1.09	0.39	1.16	0.91	0.91	0.39	1.16
Non-Chlorinated Phenolic Compounds	*30*	0.02	0.02	0.02	0.03	0.00	0.00	0.02	0.02	0.00	0.04
Ammonia (as N)	*600*	1.60	2.07	3.30	2.84	0.88	2.62	2.07	2.07	0.88	2.62
Total HCH (Lindane)	*0.004*	0.72	1.04	0.92	1.06	0.10	0.31	1.04	1.04	0.10	1.54

Parameter	2001 Ocean Plan Criteria (ug/L)	Hazard Quotient for Daily Maximum Concentration (unitless)									
Arsenic	*32*	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Cadmium	*4*	0.02	0.03	0.03	0.03	0.00	0.01	0.03	0.03	0.00	0.04
Chromium	*8*	0.65	0.94	0.95	1.01	0.10	0.13	0.94	0.94	0.10	1.39
Copper	*12*	1.55	2.14	2.58	2.50	0.38	0.42	2.14	2.14	0.38	3.04
Lead	*8*	0.19	0.28	0.24	0.28	0.02	0.05	0.28	0.28	0.02	0.41
Mercury	*0.16*	0.29	0.40	0.54	0.50	0.05	0.09	0.40	0.40	0.05	0.58
Nickel	*20*	1.06	1.48	1.52	1.60	0.30	0.70	1.48	1.48	0.30	2.08
Selenium	*15*	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.01
Silver	*2.8*	0.18	0.23	0.22	0.24	0.08	0.08	0.23	0.23	0.08	0.30
Zinc	*80*	0.31	0.39	0.40	0.42	0.13	0.14	0.39	0.39	0.13	0.53
Cyanide	*4*	0.63	0.81	0.83	0.88	0.34	1.03	0.81	0.81	0.34	1.03
Non-Chlorinated Phenolic Compounds	*120*	0.01	0.02	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.03
Ammonia (as N)	*2400*	0.61	0.79	1.18	1.04	0.34	1.00	0.79	0.79	0.34	1.00
Total HCH (Lindane)	*0.008*	0.83	1.20	1.07	1.22	0.12	0.36	1.20	1.20	0.12	1.77

1.0 HQ values greater than 1.0 indicate a potential for adverse effects.

Table 17. Hazard Quotient for Exposure of Tijuana River Biota (Alternative 1A)

	Untreated Wastewater Concentration (ug/L)		Freshwater Quality Criteria (ug/L)		Hazard Quotient (unitless)	
	Daily Average	Daily Maximum	Chronic Exposure	Acute Exposure	Chronic Exposure	Acute Exposure
Arsenic	3.28	9.8	190	360	0.0	0.0
Cadmium	1.2	4.2	1.1	3.9	1.1	1.1
Chromium	96.2	289	11	16	8.7	18.1
Copper	258	942	12	18	21.5	52.3
Lead	22.1	88.3	3.2	82	6.9	1.1
Mercury	0.143	2.5	0.012	2.4	11.9	1.0
Nickel	156	1003	160	1400	1.0	0.7
Selenium	1.75	3.97	5	20	0.4	0.2
Silver	4.84	19	N/A	4.1	-	4.6
Zinc	376	948	110	120	3.4	7.9
Cyanide	22.5	80	5.2	22	4.3	3.6
Non-Chlorinated Phenolic Compounds	28.8	100	N/A	N/A	-	-
Total HCH (Lindane)	0.16	0.37	0.08	2	2.0	0.2

1.0 HQ values greater than 1.0 indicate a potential for adverse effects.

Table 18. Number of Potential Exceedances of Water Quality Indicators

	Number of Parameters Exceeding Reference Criteria									
	Alt. 1A	Alt. 1B	Alt. 2	Alt. 3	Alt. 4-I	Alt. 4-II	Alt. 5A	Alt. 5B	Alt. 6	Alt. 7
2009 Conditions										
SBOO Discharge (edge of mixing zone)										
Daily Average Criteria	0	0	0	0	0	0	0	0	0	0
Daily Maximum Criteria	0	0	0	0	0	0	0	0	0	0
Punta Bandera Discharge (at the border)										
Daily Average Criteria	2	2	2	2	0	2	2	2	0	6
Daily Maximum Criteria	0	0	3	1	0	0	0	0	0	4
Number of Potential Exceedances	*2*	*2*	*5*	*3*	*0*	*2*	*2*	*2*	*0*	*10*
2023 Conditions										
SBOO Discharge (edge of mixing zone)										
Daily Average Criteria	0	0	0	0	0	0	0	0	0	0
Daily Maximum Criteria	0	0	0	0	0	0	0	0	0	0
Punta Bandera Discharge (at the border)										
Daily Average Criteria	2	4	5	6	0	2	4	4	0	7
Daily Maximum Criteria	2	3	4	5	0	1	4	4	0	5
Tijuana River Discharge (at the border)										
Acute Exposure	9	0	0	0	0	0	0	0	0	0
Chronic Expsoure	6	0	0	0	0	0	0	0	0	0
Number of Potential Exceedances	*20*	*8*	*9*	*11*	*0*	*3*	*8*	*8*	*0*	*13*

APPENDIX F
COST ESTIMATES FOR ALTERNATIVES

DRAFT
SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Clean Water Act Compliance
at the
South Bay International Wastewater Treatment Plant

APPENDIX F
COST ESTIMATES FOR ALTERNATIVES

December 2004

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ACRONYMS

Acronym	Definition
CESPT	Comision Estatal de Servicios Publicos de Tijuana (State Commission of Public Services, Tijuana)
CMA	completely mixed aeration
ENR	Engineering News-Record
EPA	United States Environmental Protection Agency
IWTP	International Wastewater Treatment Plant
LLP	limited liability corporation
mgd	million gallons per day
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
OCC	original conveyance channel
O&M	operations and maintenance
PCL	parallel conveyance line
PERC	primary effluent return connection
PLWTP	Point Loma Wastewater Treatment Plant
RCL	rehabilitated conveyance line
SABWWTP	San Antonio de los Buenos Wastewater Treatment Plant
SBIWTP	South Bay International Wastewater Treatment Plant
SBOO	South Bay Ocean Outfall
SEIS	Supplemental Environmental Impact Statement
SBWRP	South Bay Water Reclamation Plant
USIBWC	United States Section, International Boundary and Water Commission

The United States Section of the International Boundary and Water Commission (USIBWC) is evaluating the potential environmental impacts of sewage treatment and disposal alternatives at the South Bay International Wastewater Treatment Plant (SBIWTP). The SBIWTP and its system of canyon collectors prevent dry weather flows of raw sewage from flowing across the border into the Tijuana River Valley, Tijuana Estuary and south San Diego beaches. The SBIWTP treats an average of 25 million gallons per day (mgd) of raw sewage originating from Tijuana and then discharges the treated advanced primary effluent approximately 3.5 miles out into the Pacific Ocean through the South Bay Ocean Outfall (SBOO). Alternatives under consideration address modifications in current sewage treatment levels and ocean disposal over a 20-year period, as well as changes in routing of the effluent for disposal south of the United States/Mexico border, at Punta Bandera, Baja California.

This appendix presents preliminary cost estimates for alternative treatment and discharge options considered. Capital and annual operating and maintenance (O&M) costs were estimated, and were used to calculate a present value for each alternative. These preliminary cost estimates should be considered order-of-magnitude cost estimates (+50%, -30%), and are provided for making relative comparisons between alternatives.

1.0 ALTERNATIVE DESCRIPTIONS

The following are brief descriptions of each of the alternatives that highlight the major new or modified components.[1] The preliminary cost estimates contain a summary of the flows directed to each key conveyance and treatment plant.

ALTERNATIVE 1: NO ACTION (OPERATION OF SBIWTP AS ADVANCED PRIMARY FACILITY)

Alternative 1 – Option A (USIBWC Continues Operating SBIWTP as Advanced Primary Facility and Mexico Does Not Rehabilitate Its Original Conveyance Channel)

In this alternative, the SBIWTP would continue to operate, providing advanced primary treatment, and all treated effluent is discharged through the SBOO. This alternative requires additional O&M at the parallel conveyance line (PCL) pump station to carry the required 50 mgd capacity.

Alternative 1 – Option B (USIBWC Continues Operating SBIWTP as Advanced Primary Facility and Mexico Rehabilitates Its Original Conveyance Channel)

In this alternative, the SBIWTP would continue to operate, providing advanced primary treatment, and all treated effluent is discharged through the SBOO. The original conveyance channel (OCC) would be renovated (RCL) to carry more wastewater for disposal at Punta Bandera. This alternative requires construction and operation of the new RCL pump station and pipeline in Mexico.

[1] For detailed descriptions of the alternatives, please refer to Chapter 2 of the Draft SEIS.

Alternative 2: Operate SBIWTP as Advanced Primary Facility with All Effluent Treated at the SBIWTP Returned to Mexico

In Alternative 2, the SBIWTP would continue to operate, providing advanced primary treatment, and all effluent would be returned to Mexico via the primary effluent return connection (PERC) for discharge at Punta Bandera. In this alternative, none of the SBIWTP effluent would be discharged through the SBOO. For this alternative, the OCC would be renovated (RCL) to carry more wastewater. This alternative requires construction and operation of a new RCL pump station and pipeline in Mexico.

Alternative 3: Operate SBIWTP as Advanced Primary Facility and Convey 14 MGD of the SBIWTP Effluent to the City of San Diego Facilities with Remainder of the SBIWTP Effluent Returned to Mexico

In Alternative 3, the SBIWTP would continue to operate, providing advanced primary treatment, and 14 mgd of primary effluent would be sent to San Diego City treatment facilities: the Point Loma Wastewater Treatment Plant (PLWTP) and the South Bay Water Reclamation Plant (SBWRP). The remaining 11 mgd of SBIWTP effluent would be returned to Mexico via PERC for discharge at Punta Bandera. This alternative includes renovation of the OCC through construction and operation of the RCL pump station and pipeline in Mexico. This alternative would also include the construction of a pipeline to convey primary effluent to the SBWRP, and a parallel sludge return line, along with necessary interconnections to existing pipelines and facilities. Capacity fees and discharge fees would have to be paid to the City of San Diego. Another key factor for this alternative would be getting cooperation/approval from the City of San Diego.

Alternative 4: Public Law 106-457 (Secondary Treatment Facility in Mexico)

Alternative 4 Option A – Operation of SBIWTP as Advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico, Discharge Option I – Discharge through the SBOO

In Alternative 4 Option A, Discharge Option I, the SBIWTP would continue to operate providing advanced primary treatment, and all effluent would be pumped to Mexico for secondary treatment. The secondary treatment effluent would return to the United States and be discharged through the SBOO. This alternative also provides for treatment in Mexico of an additional 34 mgd of wastewater originating from Mexico that is also discharged through the SBOO. The key components for this alternative are the construction of the public law treatment plant and the pump stations and pipelines necessary to convey the advanced primary effluent from the

SBIWTP to the Public Law 106-457 treatment plant for secondary treatment, and then back to the SBOO for discharge.

Alternative 4 Option A – Operation of SBIWTP as advanced Primary Facility with Secondary Treatment of the SBIWTP Effluent in Mexico, Discharge Option II – Discharge at Punta Bandera

This alternative is the same as Alternative 4 Option A, Discharge Option I, with the exception that the secondary effluent would stay in Mexico for discharge at Punta Bandera. In addition to the public law treatment plant and influent conveyance, this alternative requires construction and operation of an effluent conveyance to a new RCL line and pump station.

Alternative 4 Option B – Cease Operation of SBIWTP, Conduct all Primary and Secondary Treatment in Mexico, Discharge Option I – Discharge through the SBOO

In Alternative 4 Option B, Discharge Option I, the SBIWTP would cease operations, and primary and secondary treatment for 59 mgd would be conducted at the public law treatment plant in Mexico. All secondary effluent would be piped back to the United States and discharged through the SBOO. The key components for this alternative are the construction of the public law treatment plant and the pump stations and pipelines necessary to convey wastewater to the public law treatment plant and to convey the effluent to the SBOO.

Alternative 4 Option B – Cease Operation of SBIWTP, Conduct all Secondary Treatment in Mexico, Discharge Option II – Discharge at Punta Bandera

This alternative is the same as Alternative 4 Option B, Discharge Option I, with the exception that the secondary effluent would stay in Mexico for discharge at Punta Bandera. In addition to the public law treatment plant and influent conveyance and pump station, this alternative requires construction and operation of an effluent conveyance pipeline and a new RCL line and pump station.

Alternative 4 Option C – Bajagua LLC, Proposal - Operation of SBIWTP as advanced Primary Facility, Secondary Treatment in Mexico, Discharge Option I – Discharge through the SBOO

In Alternative 4 Option C, Discharge Option I, the SBIWTP would continue to operate providing advanced primary treatment, and all effluent would be piped to Mexico for secondary treatment in the Bajagua-proposed treatment plant. The secondary effluent would be returned to the United States and discharged through the SBOO. This alternative also provides for treatment in Mexico of an additional 34 mgd wastewater originating from Mexico that is also discharged through the SBOO. The key components for this alternative are the construction of the Bajagua treatment plant and the pump stations and pipelines necessary to convey the advanced primary effluent from the SBIWTP to the Bajagua treatment plant, and then back to the SBOO for discharge.

Alternative 4 Option C – Bajagua LLC, Proposal - Operation of SBIWTP as advanced Primary Facility, Secondary Treatment in Mexico, Discharge Option II – Discharge at Punta Bandera

This alternative is the same as Alternative 4C, Discharge Option I, with the exception that the secondary effluent would stay in Mexico for discharge at Punta Bandera. In addition to the Bajagua treatment plant and influent conveyance and pump station, this alternative requires construction and operation of an effluent conveyance pipeline, new RCL line and pump station.

Alternative 5: Secondary Treatment in the United States at the SBIWTP

Alternative 5 Option A – Completely Mixed Aeration (CMA) Ponds at SBIWTP

In this alternative, the SBIWTP continues operation, but ferric chloride addition is discontinued so that only primary treatment is provided. A completely mixed aerated pond system is constructed to provide secondary treatment for the primary wastewater produced by SBIWTP. The 25 mgd secondary effluent is then discharged through the SBOO. Improvements are also required for the OCC (RCL), including construction of the RCL pump station and pipeline.

Alternative 5 Option B-1 – Activated Sludge Secondary Treatment with Flow Equalization

In this alternative, the SBIWTP continues to provide advanced primary treatment, and an activated sludge system is constructed to provide secondary treatment for the advanced primary wastewater produced by SBIWTP. The secondary effluent is then discharged through the SBOO. Improvements are also required for the OCC (RCL), including construction of the RCL pump station and pipeline. To accommodate the large variation in flows, a 7 million gallon equalization tank would reduce the flow variability to the secondary treatment train.

Alternative 5 Option B-2 – Activated Sludge Secondary Treatment with Expanded Capacity

In this alternative, the SBIWTP continues to provide advanced primary treatment, and an activated sludge system is constructed to provide secondary treatment for the advanced primary wastewater produced by SBIWTP. The secondary effluent is then discharged through the SBOO. Improvements are also required for the OCC (RCL), including construction of the RCL pump station and pipeline. To accommodate the large variation in flows the secondary train is suitably expanded.

Alternative 6: Secondary Treatment in the United States and Mexico

Alternative 6 Option A – CMA Ponds at SBIWTP and the Public Law Treatment Plant in Mexico

This alternative is a combination of Alternative 5 Option A and Alternative 4. In this alternative, the SBIWTP continues to operate, but ferric chloride addition is discontinued so that only primary treatment is provided. A completely mixed aerated pond system is constructed to provide secondary treatment for the primary wastewater produced by SBIWTP. A Public Law 106-457 treatment plant would be constructed in Mexico to provide secondary treatment for flows beyond the capacity of the SBIWTP and SABWWTP. The secondary effluent from both the pond system and the public law treatment plant is then discharged through the SBOO.

Alternative 6 Option B – Activated Sludge System at SBIWTP and the Public Law Treatment Plant in Mexico

This alternative is a combination of Alternative 5 Option B and Alternative 4, and is the same as Alternative 6 Option A with the exception that an activated sludge system is constructed instead of the completely mixed aerated pond system at the SBIWTP to provide secondary treatment.

Alternative 7: SBIWTP Closure/Shutdown

In Alternative 7, the SBIWTP would cease operation, and no wastewater flows originating in Mexico would be discharged through the SBOO. For this alternative, the OCC would be renovated (RCL) to carry more wastewater. This alternative requires construction and operation of a new RCL pump station and pipeline.

2.0 Assumptions

The costs developed in this appendix are the costs for new facilities necessary to implement the alternative considered without regard to the source of financing (United States or Mexico). For example, facilities to be built in Mexico will have construction and O&M costs associated with the utilization of Mexican labor.

All preliminary cost estimates are shown in United States dollars. Costs obtained from, or developed in, Mexican pesos have been converted to United States dollars at the rate of 1 dollar = 11.35 pesos.

The preliminary capital cost estimates are investment cost estimates, and include construction cost, as well as costs for engineering, administration, and land. The preliminary capital cost estimates do not include contingency for site-related construction unknowns nor for the limitations in costing of alternatives at such an early stage of development. Capital costs do not include existing infrastructures that do not require significant modification or expansion. In general, O&M costs have been included for new or significantly expanded infrastructures. O&M costs have been included for the existing SBIWTP, since the operating scenarios for the SBIWTP vary for the different alternatives.

The present value calculation is based on a 20-year period of analysis, an inflation rate of 2 percent, and a discount rate of 6 percent. The useful life of structures is estimated to be greater than the 20-year analysis period, and the useful life of equipment is estimated to be 20 years. It is also assumed that the expenditure for structures and equipment is made in year zero, and no subsequent outlays for structures or equipment are made.

The preliminary annual cost for O&M is assumed to remain constant (in 2004 dollars) for the 20-year analysis period. It is assumed there is no salvage value at the end of the 20-year analysis period. Costs for National Pollutant Discharge Elimination System (NPDES) permit compliance and ocean monitoring have been isolated from the general O&M cost, and are shown separately. The level of the O&M effort was assumed to remain constant with 2 percent annual inflation.

The cost for land (lease or purchase) is accounted for in the preliminary cost estimates for the land intensive components such as treatment works. Easement acquisition costs are not specifically included for pipeline components.

The costs for construction of components in the United States consider use of local labor pool and material prices (Los Angeles area), and likewise, the costs for construction of components in Mexico consider the use of the local labor pool and material prices (Tijuana area). The average hourly labor costs were identified in References 1 and 5 and were updated to November 2004 as follows: United States labor at $29.36 per hour (U.S. dollars) and Mexican labor at $4.96 per hour (U.S. dollars). The costs are a blend of categories and include fringes.

Cost information for the alternatives was taken mainly from previous studies related to regional wastewater management. Many of the components included in the SEIS alternatives have been considered in previous studies. Where possible, capital and O&M cost estimates for entire assemblies, such as treatment plants or lift stations were taken and incorporated into the present estimates. In other places, it was only possible to take cost estimates for portions of scenarios addressed in the previous studies. In many cases it was necessary to scale the costs up or down to reflect differences in capacity used for the original study and this Draft SEIS. Information provided directly from the USIBWC also was an important source regarding O&M costs for the SBIWTP and costs related to discharge to City of San Diego treatment plants. When costs were unavailable for similar components in the previous studies, preliminary estimates of cost were generated based on EPA cost estimation data and equations and/or Parsons professional judgment and experience with similar installations.

Some of the Draft SEIS alternatives are more fully developed than others. Final design and NEPA documentation have been completed for Alternative 5 Options A and B-1. Therefore, each alternative may take a different path to completion (i.e., possibly resulting in a different project delivery method). The uncertainties inherent in the level of project development and project delivery methods may have an impact on final costs.

3.0 Cost Summary for Alternatives

A summary of capital costs, annual O&M costs and present value is provided on Table F-1. A comparison of these costs is shown on Figure F-1. Costs shown herein are preliminary draft estimates provided for information only. Tables F-2 through F-17 provide a detailed breakdown of preliminary component costs for each alternative.

DISCLAIMER: These preliminary estimates are intended solely to provide a comparison of estimated relative costs associated with alternatives considered in the Draft SEIS. These preliminary estimated costs are draft estimates and do not purport to precisely forecast exact monetary values for the alternatives under consideration in the Draft SEIS. The alternatives being considered involve significant and complex construction projects in the United States and/or Mexico and projections as well as projected future annual O&M costs over a 20-year period. The actual capital and projected annual O&M costs associated with the individual alternatives will depend upon numerous factors that may influence costs, including design and engineering expenses, equipment, materials, labor and personnel costs, market conditions, construction materials availability or lack thereof, subcontracts, overhead, taxes, insurance, location, future energy, water and other utility costs, future maintenance and repair costs, financing costs, currency exchange rates, land acquisition costs, permitting and regulatory requirements and other variables, contingencies and factors. Construction, operation and maintenance of any facilities will be contingent upon the availability of necessary funding.

Table F-1. Summary of Capital Cost, Annual O&M Cost, and Present Value

Alternative	Flow (mgd)			Capital Cost ($M)	Annual O&M Cost ($M)	Present Value ($M)
	Advanced Primary*	Secondary	Remaining Flows			
1A	50.0	--	34	$0.0	$9.4	$128.6
1B	50.0	--	34	$37.1	$8.9	$158.9
2	50.0		34	$45.7	$10.3	$186.8
3	45.0	5	34	$82.8	$15.3	$292.7
4A Discharge Option I	25.0	59	--	$137.4	$14.8	$340.0**
4A Discharge Option II	25.0	59	--	$179.8	$19.6	$448.5**
4B Discharge Option I	25.0	59	--	$172.4	$12.3	$340.9**
4B Discharge Option II	25.0	59	--	$214.7	$17.2	$449.5**
4C Discharge Option I	25.0	59	--	$133.8	$14.8	$336.1**
4C Discharge Option II	25.0	59	--	$177.9	$19.6	$446.5**
5A	25.0	25	34	$63.9	$12.5	$235.0
5B-1	25.0	25	34	$124.5	$15.5	$336.0
5B-2	25.0	25	34	$131.5	$15.5	$343.6
6A	25.0	59	--	$122.9	$15.7	$337.1
6B	25.0	59	--	$183.6	$18.6	$438.1
7	25.0		59	$45.7	$5.9	$126.6

* Includes 25 mgd treated at San Antonio de Los Buenos WTP in Mexico.

** Present value costs do not include total annual outlays (refer to cash flow summaries for actual costs).

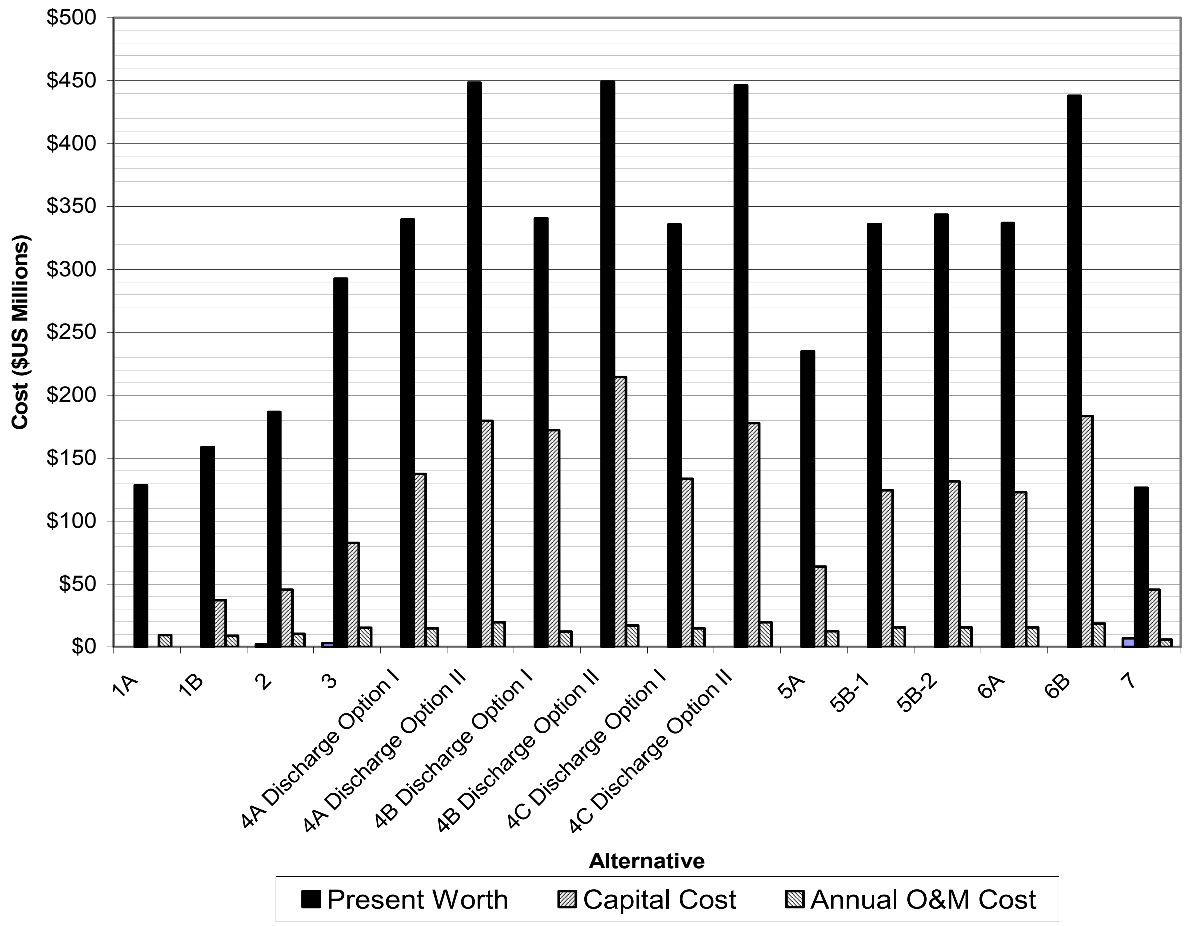

Figure F-1. Comparison of Present Value, Capital Cost and Annual O&M Costs for Alternatives

4.0 References Cited

The primary references used for generation of the preliminary cost estimates include the following:

Reference 1. Supplemental Environmental Impact Statement for the International Boundary and Water Commission South Bay International Wastewater Treatment Plant Long Term Treatment Options, CH2M Hill, January 1998 (Draft) and March 1999 (Final).

Reference 2. 1999 Drinking Water Infrastructure Needs Survey, EPA, 1999.

Reference 3. Bajagua Wastewater Treatment and Water Reclamation Project, Bajagua Project LLC, September 2001.

Reference 4. CESPT Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosario, Volume I, CDM, February 2003.

Reference 5. Identification and Evaluation of Disposal Alternatives for the Treated Wastewater Effluents of Tijuana Wastewater Effluents of Tijuana Municipality, Baja California Mexico, CSI Ingenieros, June 2004.

Reference 6. Engineering News-Record (ENR) index for Los Angeles area, McGraw Hill Construction available at http://enr.construction.com.

Table F-2. Alternative 1 Option A

Alternative 1: No Action (Operation of SBIWTP as Advanced Primary Facility)

Alternative 1A: SBIWTP would continue to provide advanced primary treatment for average flows of 25mgd and peak flow of 50mgd until secondary treatment facilities are constructed.

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=25 ; PCL=50[1] ; RCL=0; Pt. Band.=50 ; River=9

SBIWTP Primary Treatment Facility	
Capital Cost of SBIWTP Primary Treatment Facility[2] (2004 $US)	$0
Annual O&M SBIWTP Primary Treatment Facility[3] ($US/Year)	$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000
Tijuana Pump Station	
Annual O&M Tijuana Pump Station[4] ($US/year)	$3,800,000

Total Capital Cost ($US) =	**$0**
Total Annual O&M ($US) =	**$9,400,000**

1. Maximum flows the PCL has been able to carry have been significantly less than the 50 mgd design capacity.
2. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
3. Annual O&M cost for SBIWTP as reported by IBWC.
4. Additional O&M cost has been added to account for PCL carrying 25 mgd more than in the other considered alternatives.

Cash Flow Summary (Alt 1A)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$0		$0	$0
1		$9,400,000	$9,588,000	$9,045,283
2		$9,400,000	$9,779,760	$8,703,952
3		$9,400,000	$9,975,355	$8,375,501
4		$9,400,000	$10,174,862	$8,059,444
5		$9,400,000	$10,378,360	$7,755,314
6		$9,400,000	$10,585,927	$7,462,661
7		$9,400,000	$10,797,645	$7,181,051
8		$9,400,000	$11,013,598	$6,910,068
9		$9,400,000	$11,233,870	$6,649,310
10		$9,400,000	$11,458,548	$6,398,393
11		$9,400,000	$11,687,718	$6,156,944
12		$9,400,000	$11,921,473	$5,924,607
13		$9,400,000	$12,159,902	$5,701,037
14		$9,400,000	$12,403,100	$5,485,903
15		$9,400,000	$12,651,162	$5,278,888
16		$9,400,000	$12,904,186	$5,079,685
17		$9,400,000	$13,162,269	$4,887,999
18		$9,400,000	$13,425,515	$4,703,546
19		$9,400,000	$13,694,025	$4,526,053
20		$9,400,000	$13,967,906	$4,355,259
Total ($US)	**$0**	**$188,000,000**	**$232,963,182**	**$128,640,896**

Table F-3. Alternative 1 Option B

Alternative 1B: SBIWTP would continue to provide advanced primary treatment for average flows of 25 mgd and peak flows of 50mgd until secondary treatment facilities are constructed
Improve/rebuild RCL to avoid dry-weather flows to the Tijuana River

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=25 ; PCL=25 ; RCL=34 ; Pt. Band.=59 ; River=0

SBIWTP Primary Treatment Facility	
Capital Cost[1] (2004 US$)	$0
O&M SBIWTP Primary Treatment Facility (US$/Year)	$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000
RCL Improvement Cost	
3500 HP Pump Station (34 mgd)[3](2004 US$)	$9,504,147
Pipelines construction[2] (Dia=1.4m) (2004 US$)	$23,650,660
Engineering, supervision and project administration, 12% (2004 US$)	$3,978,577
Pump Station O&M[3] (US$/year)	$3,057,715
Pipelines O&M at 1% of construction cost (US$/year)	$236,507

Total Capital Cost ($US) =	**$37,133,384**
Total Annual O&M ($US) =	**$8,894,221**

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
2. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
3. Cost based on cost equations from Reference 4 Appendix R Section 6.

Table F-3. Alternative 1 Option B (Cont'd)

Cash Flow Summary (Alt 1B)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$37,133,384		$37,133,384	$37,133,384
1		$8,894,221	$9,072,106	$8,558,590
2		$8,894,221	$9,253,548	$8,235,625
3		$8,894,221	$9,438,619	$7,924,846
4		$8,894,221	$9,627,391	$7,625,796
5		$8,894,221	$9,819,939	$7,338,030
6		$8,894,221	$10,016,338	$7,061,123
7		$8,894,221	$10,216,665	$6,794,666
8		$8,894,221	$10,420,998	$6,538,263
9		$8,894,221	$10,629,418	$6,291,536
10		$8,894,221	$10,842,006	$6,054,120
11		$8,894,221	$11,058,846	$5,825,662
12		$8,894,221	$11,280,023	$5,605,826
13		$8,894,221	$11,505,624	$5,394,285
14		$8,894,221	$11,735,736	$5,190,727
15		$8,894,221	$11,970,451	$4,994,851
16		$8,894,221	$12,209,860	$4,806,366
17		$8,894,221	$12,454,057	$4,624,994
18		$8,894,221	$12,703,138	$4,450,466
19		$8,894,221	$12,957,201	$4,282,524
20		$8,894,221	$13,216,345	$4,120,919
Total ($US)	**$37,133,384**	**$177,884,428**	**$257,561,694**	**$158,852,598**

Table F-4. Alternative 2

Alternative 2: Operate SBITWP as Advanced Primary Facility with Treated Flows Conveyed to Mexico

Year: 2023

Average Flows (mgd): Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=0 ;PCL=25 ; RCL= 59 ; Pt. Band.=84

SBIWTP Primary Treatment Facility	
Capital Cost (2004 US$)	$0
O&M Cost[3,4] ($US/Year)	$5,000,000
RCL Improvement Cost	
5900 HP Pump Station (59 mgd)[2]	$14,807,284
RCL pipelines construction[1] (Dia=1.8m)	$25,959,991
Engineering, supervision and project administration, 12%	$4,892,073
Pump Station O&M[2] ($US/Year)	$5,055,273
Pipelines O&M at 1% of construction cost (US$/year)	$259,600

Total Capital Cost ($US) =	**$45,659,348**
Total Annual O&M ($US) =	**$10,314,873**

1. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
2. Cost based on cost equationss from Reference 4 Appendix R Section 6.
3. O&M cost reduced to reflect no need for ocean monitoring program.
4. Does not consider agreements for sharing the use of the outfall with the City of San Diego.

Cash Flow Summary (Alt 2A) ($US)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$45,659,348		$45,659,348	$45,659,348
1		$10,314,873	$10,521,170	$9,925,632
2		$10,314,873	$10,731,593	$9,551,080
3		$10,314,873	$10,946,225	$9,190,662
4		$10,314,873	$11,165,150	$8,843,844
5		$10,314,873	$11,388,453	$8,510,114
6		$10,314,873	$11,616,222	$8,188,978
7		$10,314,873	$11,848,546	$7,879,960
8		$10,314,873	$12,085,517	$7,582,603
9		$10,314,873	$12,327,227	$7,296,467
10		$10,314,873	$12,573,772	$7,021,129
11		$10,314,873	$12,825,247	$6,756,180
12		$10,314,873	$13,081,752	$6,501,230
13		$10,314,873	$13,343,387	$6,255,901
14		$10,314,873	$13,610,255	$6,019,829
15		$10,314,873	$13,882,460	$5,792,666
16		$10,314,873	$14,160,110	$5,574,074
17		$10,314,873	$14,443,312	$5,363,732
18		$10,314,873	$14,732,178	$5,161,327
19		$10,314,873	$15,026,822	$4,966,560
20		$10,314,873	$15,327,358	$4,779,143
Total ($US)	**$45,659,348**	**$206,297,450**	**$301,296,106**	**$186,820,460**

Table F-5. Alternative 3

Alternative 3: Operate SBIWTP with City of San Diego Connections

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=0[1] ; SBWRP=5 ;

PLWTP= 9 ; PCL=25 ; RCL=45 ; Pt. Band.=70

SBIWTP Primary Treatment Facility	
Capital Cost	$0
Annual O&M[8] ($US/Year)	$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000
Capital Cost	
	Cost of 2004 [2]
4600 HP Pump Station (45 mgd)[4]	$11,986,507
RCL Pipelines construction [3] (Dia=1.6m)	$24,805,326
Engineering, supervision and project administration, (12%) [3]	$4,415,020
New 3200 feet of 30-in pipeline to convey treated or screened effluent from SBIWTP to SBWRP[5]	$680,906
New 3500 feet of 8-in return primary and secondary waste sludge pipeline from SBWRP to SBIWTP[5]	$192,395
Interconnection for 30-in pipeline	$300,000
Interconnection for 8-in pipeline	$250,000
Interconnection to South Bay interceptor	$200,000
Capacity fee to City of San Diego[7]	$40,000,000
Total Connection Cost (2004 $US)	$82,830,153

Table F-5. Alternative 3 (Cont'd)

O&M and Annual fees	
Pump Station O&M[4]	$3,978,062
O&M for two new lines (1% of construction cost)	$256,786
Advanced Primary at PLWTP[6] (9mgd)	$3,000,000
Secondary Train at SBWRP[6] (5mgd)	$2,500,000

Total Capital Cost ($US) =	**$82,830,153**
Total Annual O&M ($US) =	**$15,334,848**

1. SBOO receives up to 5 mgd from the project flows indirectly via SBWRP.
2. Costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74.
3. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
4. Cost based on cost equations from Reference 4 Appendix R Section 6.
5. Cost estimation based on Reference 2 Appendix A-12.
6. Cost calculated based on contract fee rates for emergency discharge to PLWTP.
7. USIBWC and the City of San Diego have previously signed on a yearly basis a Memorandum of Understanding (MOU) that includes user rates for the USIBWC's short-term use, in the event of an emergency, of the City's existing connection from the SBIWTP to the PLWTP. This is a preliminary estimate that assumes a new agreement would need to be negotiated to provide for daily use of the City's facilities, and that the new agreement would include lower user rates but would also include an annual capacity fee.
8. Does not consider agreements for sharing the use of the outfall with the City of San Diego.

Cash Flow Summary (Alt 3)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$82,830,153		$82,830,153	$82,830,153
1		$15,334,848	$15,641,545	$14,756,174
2		$15,334,848	$15,954,376	$14,199,338
3		$15,334,848	$16,273,463	$13,663,514
4		$15,334,848	$16,598,932	$13,147,909
5		$15,334,848	$16,930,911	$12,651,762
6		$15,334,848	$17,269,529	$12,174,337
7		$15,334,848	$17,614,920	$11,714,928
8		$15,334,848	$17,967,218	$11,272,855
9		$15,334,848	$18,326,563	$10,847,464
10		$15,334,848	$18,693,094	$10,438,126
11		$15,334,848	$19,066,956	$10,044,234
12		$15,334,848	$19,448,295	$9,665,207
13		$15,334,848	$19,837,261	$9,300,482
14		$15,334,848	$20,234,006	$8,949,520
15		$15,334,848	$20,638,686	$8,611,803
16		$15,334,848	$21,051,460	$8,286,829
17		$15,334,848	$21,472,489	$7,974,118
18		$15,334,848	$21,901,939	$7,673,208
19		$15,334,848	$22,339,978	$7,383,653
20		$15,334,848	$22,786,777	$7,105,025
Total ($US)	**$82,830,153**	**$306,696,957**	**$462,878,552**	**$292,690,640**

Table F-6. Alternative 4 Option A Discharge Option I

Alternative 4A Discharge Option I : Public Law 106-457 (Secondary Treatment Facility in Mexico)

Discharge Option I (Sec. eff. Discharged through SBOO)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=59 ; SBOO=59 ; PCL=25 ; RCL=0 ;

Pt. Band.=25

SBIWTP Primary Treatment Facility	
Capital Cost (2004 $US)	$0
Annual O&M ($US/Year)	$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000

Project Cost	
	59 MGD Facility 2004 US$[1,3]
Public Law 106-457 Treatment Plant + Influent Pump Station + Influent Conveyance	$107,540,000
Effluent Conveyance	$15,182,435
Engr/Legal/Admin (12%)	$14,726,692
Total Project Costs	$137,449,127
Annual Operating Cost	
Pump Station/ Pipelines (US$/year)	$2,600,000
Treatment Plant (US$/year)[2]	$6,600,000

Total Capital Cost ($US) =	**$137,449,127**
Total Annual O&M ($US) =	**$14,800,000**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74
2. Operating costs include lease of land for the 20-year period.
3. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Table F-6. Alternative 4 Option A Discharge Option I (Cont'd)

Cash Flow Summary (Alt 4A Discharge Option I)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$137,449,127		$137,449,127	$137,449,127
1		$14,800,000	$15,096,000	$14,241,509
2		$14,800,000	$15,397,920	$13,704,094
3		$14,800,000	$15,705,878	$13,186,958
4		$14,800,000	$16,019,996	$12,689,337
5		$14,800,000	$16,340,396	$12,210,494
6		$14,800,000	$16,667,204	$11,749,721
7		$14,800,000	$17,000,548	$11,306,335
8		$14,800,000	$17,340,559	$10,879,681
9		$14,800,000	$17,687,370	$10,469,127
10		$14,800,000	$18,041,117	$10,074,066
11		$14,800,000	$18,401,940	$9,693,912
12		$14,800,000	$18,769,979	$9,328,104
13		$14,800,000	$19,145,378	$8,976,100
14		$14,800,000	$19,528,286	$8,637,380
15		$14,800,000	$19,918,851	$8,311,441
16		$14,800,000	$20,317,228	$7,997,801
17		$14,800,000	$20,723,573	$7,695,998
18		$14,800,000	$21,138,044	$7,405,583
19		$14,800,000	$21,560,805	$7,126,127
20		$14,800,000	$21,992,021	$6,857,216
Total ($US)	**$137,449,127**	**$296,000,000**	**$504,242,222**	**$339,990,113**
Annual payments of equal present value. ($US)				**$29,641,888**

Table F-7. Alternative 4 Option A Discharge Option II

Alternative 4A Discharge Option II : Public Law 106-457 (Secondary Treatment Facility in Mexico)

Discharge Option II (Discharge sec. eff. at Punta Bandera)

Year: 2023

Average Flows (mgd): Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=59 ; SBOO=0 ; PCL=25 ;

RCL=59 ; Pt. Band.=84

SBIWTP Primary Treatment Facility	
Capital Cost	$0
Annual O&M[5,7] ($US/Year)	$5,000,000

Project Cost	
	59 MGD Facility 2004 US$[1,8]
Public Law 106-457 Treatment Plant + Influent Pump Station + Influent Conveyance	$107,540,000
Engr/Legal/Admin (12%)	$12,904,800
Total Project Costs ($US)	$120,444,800

Table F-7. Alternative 4 Option A Discharge Option II (Cont'd)

Pump Station and Pipeline transport treated secondary eff. to Punta Bandera (RCL)	
	2004 US$
5900 HP Pump Station (59 mgd)[4]	$14,807,284
RCL pipelines construction (Dia=1.8m) + interconnection to Public Law Treatment Plant[2,3]	$38,193,849
Engineering, supervision and project administration, 12%[2]	$6,360,136
Annual Operating Cost	
	US$/year
Pump Station RCL O&M[4]	$5,055,273
RCL pipeline O&M (1% of construction cost)	$381,938
Pump Station to Public Law Treatment Plant	$2,600,000
Public Law Treatment Plant[6]	$6,600,000
Total Operating Cost	$14,637,211

Total Capital Cost ($US) =	**$179,806,069**
Total Annual O&M ($US) =	**$19,637,211**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74.
2. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
3. Cost was extracted from Reference 5 Appendix IIIB, Table III-B-3 pipe section 1,2,6,and 7.
4. Cost based on cost equations from Reference 4 Appendix R Section 6.
5. O&M cost reduced to reflect no need for ocean monitoring program.
6. Operating cost includes leasing of land for 20-year period.
7. Does not consider agreements for sharing the use of the outfall with the City of San Diego.
8. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Table F-7. Alternative 4 Option A Discharge Option II (Cont'd)

Cash Flow Summary (Alt 4A Discharge Option II)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$179,806,069		$179,806,069	$179,806,069
1		$19,637,211	$20,029,955	$18,896,184
2		$19,637,211	$20,430,554	$18,183,121
3		$19,637,211	$20,839,166	$17,496,965
4		$19,637,211	$21,255,949	$16,836,702
5		$19,637,211	$21,681,068	$16,201,355
6		$19,637,211	$22,114,689	$15,589,983
7		$19,637,211	$22,556,983	$15,001,682
8		$19,637,211	$23,008,123	$14,435,581
9		$19,637,211	$23,468,285	$13,890,842
10		$19,637,211	$23,937,651	$13,366,659
11		$19,637,211	$24,416,404	$12,862,257
12		$19,637,211	$24,904,732	$12,376,889
13		$19,637,211	$25,402,826	$11,909,836
14		$19,637,211	$25,910,883	$11,460,409
15		$19,637,211	$26,429,101	$11,027,940
16		$19,637,211	$26,957,683	$10,611,792
17		$19,637,211	$27,496,836	$10,211,347
18		$19,637,211	$28,046,773	$9,826,013
19		$19,637,211	$28,607,709	$9,455,220
20		$19,637,211	$29,179,863	$9,098,419
Total ($US)	**$179,806,069**	**$392,744,222**	**$666,481,300**	**$448,545,264**
Annual payments of equal present value. ($US)				**$39,106,221**

Table F-8. Alternative 4 Option B Discharge Option I

Alternative 4B Discharge Option I: Public Law Facility (Secondary Treatment in Mexico Only)

Discharge Option I (Sec. eff. Discharged through SBOO)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=0 ; SABWTP=25 ; Public Law=59 ; SBOO=59 ;

PCL=25 ; RCL=0 ; Pt. Band.=25 mgd

SBIWTP Primary Treatment Facility	
O&M (Mothballing and security services of plant)	$600,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000
Public Law Project Cost	
	59 MGD Facility escalated to 2004 price[1,3]
Public Law 106-457 Treatment Plant + Influent Pump Station + Influent Conveyance	$138,729,650
Effluent Conveyance	$15,182,435
Engr/Legal/Admin (12%)	$18,469,450
Total Project Costs ($US)	$172,381,535

Table F-8. Alternative 4 Option B Discharge Option I (Cont'd)

Public Law Annual Operating Cost (US$/year)	
Pump Station/ Pipelines to Public Law Treatment Plant	$2,600,000
Public Law Treatment Plant[2]	$8,514,000

Total Capital Cost ($US) =	**$172,381,535**
Total Annual O&M ($US) =	**$12,314,000**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74.
2. Operating cost of complete primary and secondary plant includes leasing of land for 20-year period.
3. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Cash Flow Summary (Alt 4B Discharge Option I)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$172,381,535		$172,381,535	$172,381,535
1		$12,314,000	$12,560,280	$11,849,321
2		$12,314,000	$12,811,486	$11,402,177
3		$12,314,000	$13,067,715	$10,971,906
4		$12,314,000	$13,329,070	$10,557,872
5		$12,314,000	$13,595,651	$10,159,461
6		$12,314,000	$13,867,564	$9,776,085
7		$12,314,000	$14,144,915	$9,407,177
8		$12,314,000	$14,427,814	$9,052,189
9		$12,314,000	$14,716,370	$8,710,597
10		$12,314,000	$15,010,697	$8,381,895
11		$12,314,000	$15,310,911	$8,065,597
12		$12,314,000	$15,617,129	$7,761,235
13		$12,314,000	$15,929,472	$7,468,358
14		$12,314,000	$16,248,061	$7,186,533
15		$12,314,000	$16,573,023	$6,915,343
16		$12,314,000	$16,904,483	$6,654,387
17		$12,314,000	$17,242,573	$6,403,278
18		$12,314,000	$17,587,424	$6,161,645
19		$12,314,000	$17,939,173	$5,929,130
20		$12,314,000	$18,297,956	$5,705,389
Total ($US)	**$172,381,535**	**$246,280,000**	**$477,563,303**	**$340,901,109**
Annual payments of equal present value. ($US)				**$29,721,313**

Table F-9. Alternative 4 Option B Discharge Option II

Alternative 4B Discharge Option II (Discharge sec. eff. at Punta Bandera)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=0 ; SABWTP=25 ; Public Law=59 ; SBOO=0 ;

PCL=25 ; RCL=59 ; Pt. Band.=84

SBIWTP Primary Treatment Facility	
O&M (Mothballing and security services)[7]	$600,000
Public Law Project Cost	
	59 MGD Facility escalated to 2004 price[1,8]
Public Law 106-457 Treatment Plant + Influent Pump Station + Influent Conveyance	$138,729,650
Engr/Legal/Admin (12%)	$16,647,558
Total Project Costs ($US)	$155,377,208

Table F-9. Alternative 4 Option B Discharge Option II (Cont'd)

Pump Station and Pipeline transport treated secondary eff. to Punta Band.	
	Cost of 2004
5900 HP Pump Station (59 mgd)[5]	$14,807,284
RCL pipelines construction (Dia=1.8m) + interconnection to Public Law Treatment Plant[3,4]	$38,193,849
Engineering, supervision and project administration, 12%[3]	$6,360,136
Annual Operating Cost (US$/year)	
Pump Station RCL O&M[5]	$5,055,273
RCL pipeline O&M (1% of construction cost)	$381,938
Pump Station/Pipelines to public law treatment plant[1]	$2,600,000
Treatment Plant[1, 6]	$8,514,000

Total Capital Cost ($US) =	**$214,738,477**
Total Annual O&M ($US) =	**$17,151,211**

1. Cost based on Bajagua Proposal of Public Law Facility
2. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74.
3. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
4. Cost was extracted from Reference 5 Appendix IIIB, Table III-B-3 pipe section 1,2,6,and 7.
5. Cost based on cost equations from Reference 4 Appendix R Section 6.
6. Operating costs include lease of land for the 20-year period.
7. Does not consider agreements for sharing the use of the outfall with the City of San Diego.
8. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Table F-9. Alternative 4 Option B Discharge Option II (Cont'd)

Cash Flow Summary (Alt 4B Discharge Option II)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$214,738,477		$214,738,477	$214,738,477
1		$17,151,211	$17,494,235	$16,503,996
2		$17,151,211	$17,844,120	$15,881,203
3		$17,151,211	$18,201,002	$15,281,913
4		$17,151,211	$18,565,022	$14,705,237
5		$17,151,211	$18,936,323	$14,150,322
6		$17,151,211	$19,315,049	$13,616,348
7		$17,151,211	$19,701,350	$13,102,523
8		$17,151,211	$20,095,377	$12,608,088
9		$17,151,211	$20,497,285	$12,132,311
10		$17,151,211	$20,907,231	$11,674,488
11		$17,151,211	$21,325,375	$11,233,942
12		$17,151,211	$21,751,883	$10,810,019
13		$17,151,211	$22,186,920	$10,402,094
14		$17,151,211	$22,630,659	$10,009,562
15		$17,151,211	$23,083,272	$9,631,843
16		$17,151,211	$23,544,937	$9,268,377
17		$17,151,211	$24,015,836	$8,918,627
18		$17,151,211	$24,496,153	$8,582,075
19		$17,151,211	$24,986,076	$8,258,223
20		$17,151,211	$25,485,797	$7,946,592
Total ($US)	**$214,738,477**	**$343,024,222**	**$639,802,381**	**$449,456,261**
Annual payments of equal present value. ($US)				**$39,185,646**

Table F-10. Alternative 4 Option C Discharge Option I

Alternative 4C Discharge Option I: Bajagua LLC Proposal - Operation of SBIWTP as Advanced Primary Facility, Secondary Treatment in Mexico

Discharge Option I (Sec. eff. Discharged through SBOO)

Year: 2023

Average Flows (mgd): Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=59 ; SBOO=59 ; PCL=25 ; RCL=0 ;

Pt. Band.=25

SBIWTP Primary Treatment Facility			
Capital Cost			$0
Annual O&M ($US/Year)			$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)			$600,000
Project Cost[1]			
	50 MGD Facility (Year 2000 price)	Scaled to 59 MGD Facility (Year 2000 price)	59 MGD Facility escalated to 2004 price[2]
Preliminary Expenses	$12,100,000	$13,558,775	$15,699,047
Bajagua Treatment Plant	$32,360,000	$36,261,320	$41,985,220
Influent Pump Station	$3,795,000	$4,252,525	$4,923,792
Influent Conveyance	$11,350,000	$12,718,355	$14,725,966
Effluent Conveyance	$11,700,000	$13,110,551	$15,180,070
Engr/Legal/Admin	$8,500,000	$9,524,760	$11,028,256
Subtotal Direct Costs	$79,805,000	$89,426,286	$103,542,351
Interest During Construction	$3,611,000	$4,046,342	$4,685,063
Bank Fees	$900,000	$1,008,504	$1,167,698
Working Capital	$500,000	$560,280	$648,721
Debt Service Reserve	$3,900,000	$4,370,184	$5,060,023
Subtotal Indirect Costs	$8,911,000	$9,985,310	$11,561,505
Contingency	$2,500,000	$2,801,400	$3,243,605
Permits and Fees	$2,500,000	$2,801,400	$3,243,605
Developer Fee at 10%	$9,372,000	$10,501,888	$12,159,625
Total Project Costs ($US)	$103,088,000	$115,516,283	$133,750,690

Table F-10. Alternative 4 Option C Discharge Option I (Cont'd)

Annual Operating Cost[1]			
Pump Station/ Pipelines : Bajagua WWTP	50 MGD (Year 2000 price)	Scaled to 59 MGD (Year 2000 price)	Cost escalated to 2004[2,4]
Electric Power	$741,000	$830,335	$961,404
Operation	$61,000	$68,354	$79,144
Maintenance	$286,000	$320,480	$371,068
Bajagua Wastewater Treatment Plant	50 MGD (Year 2000 price)	Scaled to 59 MGD (Year 2000 price)	Cost escalated to 2004[2]
Electric Power	$3,002,000	$3,363,921	$3,894,921
Operation	$340,000	$380,990	$441,130
Maintenance	$1,337,000	$1,498,189	$1,734,680
Land Lease	$1,312,000	$1,470,175	$1,702,244
Total Operating Cost[3]	$7,079,000	$7,932,444	$9,184,591

Total Capital Cost ($US) =	**$133,750,690**
Total Annual O&M ($US) =	**$14,784,591**

1. Cost based on Reference 3.
2. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74
3. Operating costs include lease of land for the 20-year period.
4. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Cash Flow Summary (Alt 4C Discharge Option I)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$133,750,690		$133,750,690	$133,750,690
1		$14,784,591	$15,080,283	$14,226,682
2		$14,784,591	$15,381,889	$13,689,826
3		$14,784,591	$15,689,526	$13,173,229
4		$14,784,591	$16,003,317	$12,676,126
5		$14,784,591	$16,323,383	$12,197,782
6		$14,784,591	$16,649,851	$11,737,488
7		$14,784,591	$16,982,848	$11,294,564
8		$14,784,591	$17,322,505	$10,868,354
9		$14,784,591	$17,668,955	$10,458,227
10		$14,784,591	$18,022,334	$10,063,577
11		$14,784,591	$18,382,781	$9,683,820
12		$14,784,591	$18,750,436	$9,318,392
13		$14,784,591	$19,125,445	$8,966,755
14		$14,784,591	$19,507,954	$8,628,387
15		$14,784,591	$19,898,113	$8,302,787
16		$14,784,591	$20,296,075	$7,989,475
17		$14,784,591	$20,701,997	$7,687,985
18		$14,784,591	$21,116,037	$7,397,872
19		$14,784,591	$21,538,358	$7,118,707
20		$14,784,591	$21,969,125	$6,850,077
Total ($US)	**$133,750,690**	**$295,691,824**	**$500,161,904**	**$336,080,804**
Annual payments of equal present value. ($US)				**$29,301,057**

Table F-11. Alternative 4 Option C Discharge Option II

Alternative 4C Discharge Option II (Discharge sec. eff. at Punta Bandera)

Year: 2023

Average Flows (mgd): Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=59 ; SBOO=0 ; PCL=25 ; RCL=59 ;

Punta Bandera=84

SBIWTP Primary Treatment Facility			
Capital Cost			$0
Annual O&M[6,8]			$5,000,000
Project Cost			
	50 MGD Facility (Year 2000 price)	Scaled to 59 MGD Facility (Year 2000 price)	59 MGD Facility escalated to 2004 price[1,9]
Preliminary Expenses	$12,100,000	$13,558,775	$15,699,047
Bajagua Treatment Plant	$32,360,000	$36,261,320	$41,985,220
Influent Pump Station	$3,795,000	$4,252,525	$4,923,792
Influent Conveyance	$11,350,000	$12,718,355	$14,725,966
Engr/Legal/Admin	$8,500,000	$9,524,760	$11,028,256
Subtotal Direct Costs	$68,105,000	$76,315,735	$88,362,280
Interest During Construction	$3,611,000	$4,046,342	$4,685,063
Bank Fees	$900,000	$1,008,504	$1,167,698
Working Capital	$500,000	$560,280	$648,721
Debt Service Reserve	$3,900,000	$4,370,184	$5,060,023
Subtotal Indirect Costs	$8,911,000	$9,985,310	$11,561,505
Contingency	$2,500,000	$2,801,400	$3,243,605
Permits and Fees	$2,500,000	$2,801,400	$3,243,605
Developer Fee at 10%	$9,372,000	$10,501,888	$12,159,625
Total Project Costs ($US)	$91,388,000	$102,405,732	$118,570,620

Table F-11. Alternative 4 Option C Discharge Option II (Contd)

Pump Station and Pipeline transport treated secondary eff. to Punta Band.			
			2004 US$
5900 HP Pump Station (59 mgd)[5]			$14,807,284
RCL pipelines construction (Dia=1.8m) + interconnection to Public Law Treatment Plant[3,4]			$38,193,849
Engineering, supervision and project administration, 12%[3]			$6,360,136
Annual Operating Cost			
			2004 US$
Pump Station RCL O&M[5]			$5,055,273
RCL pipeline O&M (1% of construction cost)			$381,938
Pump Station/ Pipelines[1] to Bajagua WWTP	50 MGD (Year 2000 price)	Scaled to 59 MGD (Year 2000 price)	Cost escalated to 2004 US$[1]
Electric Power	$741,000	$830,335	$961,404
Operation	$61,000	$68,354	$79,144
Maintenance	$286,000	$320,480	$371,068
Bajagua Wastewater Treatment Plant[1, 7]	50 MGD (Year 2000 price)	Scaled to 59 MGD (Year 2000 price)	Cost escalated to 2004 US$[2]
Electric Power	$3,002,000	$3,363,921	$3,894,921
Operation	$340,000	$380,990	$441,130
Maintenance	$1,337,000	$1,498,189	$1,734,680
Land Lease	$1,312,000	$1,470,175	$1,702,244
Total Operating Cost ($US)	$7,079,000	$7,932,444	$9,184,591

Total Capital Cost ($US) =	**$177,931,889**
Total Annual O&M ($US) =	**$19,621,802**

1. Cost based on Reference 3.
2. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74.
3. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.
4. Cost was extracted from Reference 5 Appendix IIIB, Table III-B-3 pipe section 1,2,6,and 7.
5. Cost based on cost equations from Reference 4 Appendix R Section 6.
6. O&M cost reduced to reflect no need for ocean monitoring program.
7. Operating cost includes leasing 204 acres for 20-year period.
8. Does not consider agreements for sharing the use of the outfall with the City of San Diego.
9. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

Table F-11. Alternative 4 Option C Discharge Option II (Contd)

Cash Flow Summary (Alt 4C Discharge Option II)

Inflation Rate = 2 %
Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$177,931,889		$177,931,889	$177,931,889
1		$19,621,802	$20,014,238	$18,881,357
2		$19,621,802	$20,414,523	$18,168,853
3		$19,621,802	$20,822,814	$17,483,236
4		$19,621,802	$21,239,270	$16,823,491
5		$19,621,802	$21,664,055	$16,188,642
6		$19,621,802	$22,097,336	$15,577,750
7		$19,621,802	$22,539,283	$14,989,911
8		$19,621,802	$22,990,069	$14,424,254
9		$19,621,802	$23,449,870	$13,879,942
10		$19,621,802	$23,918,867	$13,356,171
11		$19,621,802	$24,397,245	$12,852,164
12		$19,621,802	$24,885,190	$12,367,177
13		$19,621,802	$25,382,894	$11,900,491
14		$19,621,802	$25,890,551	$11,451,416
15		$19,621,802	$26,408,362	$11,019,287
16		$19,621,802	$26,936,530	$10,603,465
17		$19,621,802	$27,475,260	$10,203,334
18		$19,621,802	$28,024,765	$9,818,303
19		$19,621,802	$28,585,261	$9,447,801
20		$19,621,802	$29,156,966	$9,091,280
Total ($US)	**$177,931,889**	**$392,436,046**	**$664,225,239**	**$446,460,212**
Annual payments of equal present value. ($US)				**$38,924,437**

Table F-12. Alternative 5 Option A

Alternative 5 Option A: Completely Mixed Aeration (CMA) Ponds at SBIWTP

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=25 ; Punta Bandera=59 ; PCL=25 ; RCL=34

SBIWTP Primary Treatment Facility

Capital Cost[1]	$0
Annual O&M[2] ($US/Year)	$4,242,223
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
2. The O&M cost has been reduced to account for doing primary treatment instead of advanced primary treatment, see Reference 1.

RCL Improvement Cost

3500 HP Pump Station (34 mgd)[1](2004 US$)	$9,504,147
Pipelines construction[2] (Dia=1.4m) (2004 US$)	$23,650,660
Engineering, supervision and project administration, 12% (2004 US$)	$3,978,577
Pump Station O&M[1] (US$/year)	$3,057,715
Pipelines O&M at 1% of capital cost (US$/year)	$236,507

1. Cost based on cost equations from Reference 4 Appendix R Section 6.
2. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.

Capital Cost of 25 MGD Modified CMA Pond System[1,2,7] (Secondary Treatment)

Item	Structure[3]	Equipment[4]	Subtotal	Engineering Legal & Admin. 25%	Total Capital Cost	Total Capital Cost escalated to 2004 US$[6]
Ponds	$11,081,000	$3,171,000	$14,252,000	$3,563,000	$17,815,000	$21,986,628
Distribution Structures	$121,000	$74,000	$195,000	$49,000	$244,000	$301,136
Pump Stations	$139,000	$127,000	$266,000	$66,000	$332,000	$409,742
Control Building[5]	$323,000	$2,284,000	$2,607,000	$652,000	$3,259,000	$4,022,140
TOTALS ($US)	$11,664,000	$5,656,000	$17,320,000	$4,330,000	$21,650,000	$26,719,646

Notes:
1. Construction costs from Reference 1 adjusted to the ENR Construction Cost Index for Los Angeles for August 1997 of 6631.
2. Construction costs include "Contractors Operations Costs", taxes, and contractor's profits. "Contractors Operation costs" include bonds, permits, insurance, mobilization, staffing, running the project, coordination, temporary facilities, etc
3. Structure includes grading, concrete, site civil and mechanical such as piping
4. Equipment includes metals, finishes, wood and plastics, equipment, instrumentation and control I &C and electrical.
5. Control Building includes emergency generator standby power
6. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74
7. Costs for land included for pond system.

Annual Operating Costs for Secondary Train[1,2,3]

Alternative	Secondary Treatment [4]	Equalization Basin	Solids Treatment[5,6]	Total Operating Cost	Total O&M Cost escalated to 2004 US$[7]
Alternative 5A	$1,521,000	$0	$2,020,000	$3,541,000	$4,370,174

Notes:
1. All operating costs from Reference 1 are relative to August 1997.
2. The cost of power is estimated at $0.10/kWh
3. Labor is estimated at an average rate of $61,060 per year including salary burden for 2080 annual hours of work.
4. Includes all costs of secondary treatment including thickening of waste activated sludge and the annualized cost of sludge removal from ponds.
5. Includes the cost of sludge thickening, dewatering, and treatment using lime stabilization, but does not include the cost of thickening of waste activated sludge or the cost of sludge removal from ponds.
6. Does not include the cost of sludge disposal in Mexico
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74

	Cost escalated to 2004 US$
Total Capital Cost ($US) =	$63,853,029.46
Total Annual O&M ($US) =	$12,506,618.77

Table F-12. Alternative 5 Option A (Cont'd)

Cash Flow Summary (Alt 5A)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$63,853,029		$63,853,029	$63,853,029
1		$12,506,619	$12,756,751	$12,034,671
2		$12,506,619	$13,011,886	$11,580,532
3		$12,506,619	$13,272,124	$11,143,531
4		$12,506,619	$13,537,566	$10,723,021
5		$12,506,619	$13,808,318	$10,318,378
6		$12,506,619	$14,084,484	$9,929,005
7		$12,506,619	$14,366,174	$9,554,326
8		$12,506,619	$14,653,497	$9,193,785
9		$12,506,619	$14,946,567	$8,846,850
10		$12,506,619	$15,245,498	$8,513,007
11		$12,506,619	$15,550,408	$8,191,761
12		$12,506,619	$15,861,417	$7,882,638
13		$12,506,619	$16,178,645	$7,585,180
14		$12,506,619	$16,502,218	$7,298,947
15		$12,506,619	$16,832,262	$7,023,515
16		$12,506,619	$17,168,907	$6,758,477
17		$12,506,619	$17,512,286	$6,503,440
18		$12,506,619	$17,862,531	$6,258,027
19		$12,506,619	$18,219,782	$6,021,875
20		$12,506,619	$18,584,178	$5,794,634
Total ($US)	**$63,853,029**	**$250,132,375**	**$373,808,530**	**$235,008,630**

Table F-13. Alternative 5 Option B-1

Alternative 5B-1: Activated Sludge Secondary Treatment at SBIWTP (with Equalization Tank)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=25 ; Punta Bandera=59 ; PCL=25 ; RCL=34

SBIWTP Primary Treatment Facility

Capital Cost[1]	$0
Annual O&M[2]	$5,000,000
NPDES Permit and Oceanographic Monitoring (2004 $US)	$600,000

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
2. Do not reduce O&M cost since advanced primary treatment will continue per Reference 1.

RCL Improvement Cost

3500 HP Pump Station (34 mgd)[1](2004 US$)	$9,504,147
Pipelines construction[2] (Dia=1.4m) (2004 US$)	$23,650,660
Engineering, supervision and project administration, 12% (2004 US$)	$3,978,577
Pump Station O&M[1] (US$/year)	$3,057,715
Pipelines O&M at 1% of capital cost (US$/year)	$236,507

1. Cost based on cost equations from Reference 4 Appendix R Section 6.
2. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.

Capital Cost of 25-mgd Peak Flow Activated Sludge Facilities[1,2,8] (Secondary Treatment)

Item	Structure[3]	Equipment[4]	Subtotal	Engineering Legal & Admin. 25%	Total Capital Cost	Total Capital Cost escalated to 2004 US$[7]
Activated Sludges[5]	$17,559,000	$9,046,000	$26,605,000	$6,651,000	$33,256,000	$41,043,351
Secondary Sedimentation	$9,905,000	$6,071,000	$15,975,000	$3,994,000	$19,969,000	$24,645,016
Dissolved Air Flotation	$1,075,000	$879,000	$1,954,000	$488,000	$2,442,000	$3,013,828
Sludge Storage	$1,245,000	$438,000	$1,684,000	$421,000	$2,105,000	$2,597,915
Standby Power	$222,000	$787,000	$1,009,000	$252,000	$1,261,000	$1,556,281
Support Facilities[6]	$4,857,000	$994,000	$5,851,000	$1,463,000	$7,314,000	$9,026,674
Equalization Facilities	$3,125,000	$439,000	$3,564,000	$891,000	$4,455,000	$5,498,200
TOTALS ($US)	$37,988,000	$18,654,000	$56,642,000	$14,160,000	$70,802,000	$87,381,264

Notes:
1. Construction costs from Reference 1 adjusted to the ENR Construction Cost Index for Los Angeles for August 1997 of 6631.
2. Construction costs include "Contractors Operations Costs", taxes, and contractor's profits. "Contractors Operation costs" include bonds, permits, insurance, mobilization, staffing, running the project, coordination, temporary facilities, etc
3. Structure includes grading, concrete, site civil and mechanical such as piping
4. Equipment includes metals, finishes, wood and plastics, equipment, instrumentation and control I &C and electrical.
5. Activated sludge includes activated sludge tanks with anoxic selectors and a blower facility with 4 blowers.
6. Support facilities include extension of yard piping, power and site work related to the construction of the proposed facilities
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74
8. Cost for land not included since plant would be constructed on land already owned and part of the SBIWTP site.

Annual Operating Costs for Secondary Train[1,2,3]

Alternative	Secondary Treatment[4]	Equalization Basin	Solids Treatment[5,6]	Total Operating Cost	Total O&M Cost escalated to 2004 US$[7]
Alternative 5B-1	$2,466,000	$33,000	$2,817,000	$5,316,000	$6,560,815

Notes:
1. All operating costs from Reference 1 are relative to August 1997.
2. The cost of power is estimated at $0.10/kWh
3. Labor is estimated at an average rate of $61,060 per year including salary burden for 2080 annual hours of work.
4. Includes all costs of secondary treatment including thickening of waste activated sludge and the annualized cost of sludge removal from ponds.
5. Includes the cost of sludge thickening, dewatering, and treatment using lime stabilization, but does not include the cost of thickening of waste activated sludge or the cost of sludge removal from ponds.
6. Does not include the cost of sludge disposal in Mexico
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74

Table F-13. Alternative 5 Option B-1 (Cont'd)

		Cost escalated to 2004 US$
Total Capital Cost ($US) =		$124,514,647
Total Annual O&M ($US) =		$15,455,036

Cash Flow Summary (Alt 5B-2)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$124,514,647		$124,514,647	$124,514,647
1		$15,455,036	$15,764,137	$14,871,827
2		$15,455,036	$16,079,419	$14,310,626
3		$15,455,036	$16,401,008	$13,770,602
4		$15,455,036	$16,729,028	$13,250,957
5		$15,455,036	$17,063,609	$12,750,921
6		$15,455,036	$17,404,881	$12,269,754
7		$15,455,036	$17,752,978	$11,806,745
8		$15,455,036	$18,108,038	$11,361,207
9		$15,455,036	$18,470,199	$10,932,482
10		$15,455,036	$18,839,603	$10,519,936
11		$15,455,036	$19,216,395	$10,122,957
12		$15,455,036	$19,600,723	$9,740,959
13		$15,455,036	$19,992,737	$9,373,375
14		$15,455,036	$20,392,592	$9,019,663
15		$15,455,036	$20,800,444	$8,679,298
16		$15,455,036	$21,216,453	$8,351,778
17		$15,455,036	$21,640,782	$8,036,616
18		$15,455,036	$22,073,597	$7,733,348
19		$15,455,036	$22,515,069	$7,441,523
20		$15,455,036	$22,965,371	$7,160,711
Total ($US)	**$124,514,647**	**$309,100,721**	**$507,541,708**	**$336,019,933**

Table F-14. Alternative 5 Option B-2

Alternative 5B-2: Activated Sludge Secondary Treatment at SBIWTP (with Expanded Secondary Train)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; SBOO=25 ; Punta Bandera=59 ; PCL=25 ; RCL=34

SBIWTP Primary Treatment Facility

Capital Cost[1]	$0
Annual O&M[2]	$5,000,000
NPDES Permit and Oceanographic Monitoring (2004 $US)	$600,000

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
2. Do not reduce O&M cost since advanced primary treatment will continue per Reference 1.

RCL Improvement Cost

3500 HP Pump Station (34 mgd)[1] (2004 US$)	$9,504,147
Pipelines construction[2] (Dia=1.4m) (2004 US$)	$23,650,660
Engineering, supervision and project administration, 12% (2004 US$)	$3,978,577
Pump Station O&M[1] (US$/year)	$3,057,715
Pipelines O&M at 1% of capital cost (US$/year)	$236,507

1. Cost based on cost equations from Reference 4 Appendix R Section 6.
2. Cost based on Reference 5 Appendix IIIB, Table III-B-3 with adjustment to account for difference in diameter.

Capital Cost of 25-mgd Peak Flow Activated Sludge Facilities[1,2,8] (Secondary Treatment)

Item	Structure[3]	Equipment[4]	Subtotal	Engineering Legal & Admin. 25%	Total Capital Cost	Total Capital Cost escalated to 2004 US$[7]
Activated Sludges[5]	$17,991,000	$9,269,000	$27,260,000	$6,815,000	$34,075,000	$42,054,131
Secondary Sedimentation	$13,430,000	$8,231,000	$21,661,000	$5,415,000	$27,076,000	$33,416,218
Dissolved Air Flotation	$1,075,000	$879,000	$1,954,000	$488,000	$2,442,000	$3,013,828
Sludge Storage	$1,246,000	$438,000	$1,684,000	$421,000	$2,105,000	$2,597,915
Standby Power	$296,000	$1,050,000	$1,346,000	$337,000	$1,683,000	$2,077,098
Support Facilities[6]	$5,540,000	$1,135,000	$6,675,000	$1,669,000	$8,344,000	$10,297,863
Additional Land	--	--	--	--	$550,000	$678,790
Hazardous Waste Remediaton	--	--	--	--	$226,000	$278,921
TOTALS ($US)	$39,578,000	$21,002,000	$60,580,000	$15,145,000	$76,501,000	$94,414,763

Notes:
1. Construction costs from Reference 1 adjusted to the ENR Construction Cost Index for Los Angeles for August 1997 of 6631.
2. Construction costs include "Contractors Operations Costs", taxes, and contractor's profits. "Contractors Operation costs" include bonds, permits, insurance, mobilization, staffing, running the project, coordination, temporary facilities, etc
3. Structure includes grading, concrete, site civil and mechanical such as piping
4. Equipment includes metals, finishes, wood and plastics, equipment, instrumentation and control I &C and electrical.
5. Activated sludge includes activated sludge tanks with anoxic selectors and a blower facility with 4 blowers.
6. Support facilities include extension of yard piping, power and site work related to the construction of the proposed facilities
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74
8. Cost for land not included since plant would be constructed on land already owned and part of the SBIWTP site.

Table F-14. Alternative 5 Option B-2 (Cont'd)

Annual Operating Costs for Secondary Train[1,2,3]

Alternative	Secondary Treatment[4]	Equalization Basin	Solids Treatment[5,6]	Total Operating Cost	Total O&M Cost escalated to 2004 US$[7]
Alternative 5B-2	$2,529,000	$0	$2,817,000	$5,346,000	$6,597,840

Notes:
1. All operating costs from Reference 1 are relative to August 1997.
2. The cost of power is estimated at $0.10/kWh
3. Labor is estimated at an average rate of $61,060 per year including salary burden for 2080 annual hours of work.
4. Includes all costs of secondary treatment including thickening of waste activated sludge and the annualized cost of sludge removal from ponds.
5. Includes the cost of sludge thickening, dewatering, and treatment using lime stabilization, but does not include the cost of thickening of waste activated sludge or the cost of sludge removal from ponds.
6. Does not include the cost of sludge disposal in Mexico
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74

		Cost escalated to 2004 US$
Total Capital Cost ($US) =		$131,548,147
Total Annual O&M ($US) =		$15,492,061

Cash Flow Summary (Alt 5B-2)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$131,548,147		$131,548,147	$131,548,147
1		$15,492,061	$15,801,902	$14,907,455
2		$15,492,061	$16,117,940	$14,344,909
3		$15,492,061	$16,440,299	$13,803,592
4		$15,492,061	$16,769,105	$13,282,702
5		$15,492,061	$17,104,487	$12,781,468
6		$15,492,061	$17,446,577	$12,299,148
7		$15,492,061	$17,795,508	$11,835,029
8		$15,492,061	$18,151,419	$11,388,425
9		$15,492,061	$18,514,447	$10,958,673
10		$15,492,061	$18,884,736	$10,545,138
11		$15,492,061	$19,262,431	$10,147,208
12		$15,492,061	$19,647,679	$9,764,295
13		$15,492,061	$20,040,633	$9,395,831
14		$15,492,061	$20,441,445	$9,041,271
15		$15,492,061	$20,850,274	$8,700,091
16		$15,492,061	$21,267,280	$8,371,786
17		$15,492,061	$21,692,625	$8,055,869
18		$15,492,061	$22,126,478	$7,751,874
19		$15,492,061	$22,569,007	$7,459,351
20		$15,492,061	$23,020,388	$7,177,866
Total ($US)	**$131,548,147**	**$309,841,219**	**$515,492,807**	**$343,560,126**

Table F-15. Alternative 6 Option A

Alternative 6A: Secondary Treatment in the United States and in Mexico

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=34 ; SBOO=59 ; PCL=25 ; Punta Bandera=25

US Facilities (CMA Pond)

SBIWTP Primary Treatment Facility

Capital Cost[1] (2004 $US)	$0
Annual O&M[2] ($US/Year)	$4,242,223
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.

2. The O&M cost has been reduced to account for doing primary treatment instead of advanced primary treatment, see Reference 1.

Capital Cost of 25 MGD Modified CMA Pond System[1,2,7] (Secondary Treatment in US)

Item	Structure[3]	Equipment[4]	Subtotal	Engineering Legal & Admin. 25%	Total Capital Cost	Total Capital Cost escalated to 2004 US$[6]
Ponds	$11,081,000	$3,171,000	$14,252,000	$3,563,000	$17,815,000	$21,986,628
Distribution Structures	$121,000	$74,000	$195,000	$49,000	$244,000	$301,136
Pump Stations	$139,000	$127,000	$266,000	$66,000	$332,000	$409,742
Control Building[5]	$323,000	$2,284,000	$2,607,000	$652,000	$3,259,000	$4,022,140
TOTALS ($US)	$11,664,000	$5,656,000	$17,320,000	$4,330,000	$21,650,000	$26,719,646

Notes:
1. Construction costs from Reference 1 adjusted to the ENR Construction Cost Index for Los Angeles for August 1997 of 6631.
2. Construction costs include "Contractors Operations Costs", taxes, and contractor's profits. "Contractors Operation costs" include bonds, permits, insurance, mobilization, staffing, running the project, coordination, temporary facilities, etc
3. Structure includes grading, concrete, site civil and mechanical such as piping
4. Equipment includes metals, finishes, wood and plastics, equipment, instrumentation and control I &C and electrical.
5. Control Building includes emergency generator standby power
6. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74
7. Costs for land included for pond system.

Annual Operating Costs for Secondary Train[1,2,3]

Alternative	Secondary Treatment[4]	Equalization Basin	Solids Treatment[5,6]	Total Operating Cost	Total O&M Cost escalated to 2004 US$[7]
O&M for secondary CMA	$1,521,000	$0	$2,020,000	$3,541,000	$4,370,174

Notes:
1. All operating from Reference 1 costs are relative to August 1997.
2. The cost of power is estimated at $0.10/kWh
3. Labor is estimated at an average rate of $61,060 per year including salary burden for 2080 annual hours of work.
4. Includes all costs of secondary treatment including thickening of waste activated sludge and the annualized cost of sludge removal from ponds.
5. Includes the cost of sludge thickening, dewatering, and treatment using lime stabilization, but does not include the cost of thickening of waste activated sludge or the cost of sludge removal from ponds.
6. Does not include the cost of sludge disposal in Mexico
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74

Total Capital Cost ($US) in US =	$26,719,645.75
Total Annual O&M ($US) in US =	$9,212,397.37

Table F-15. Alternative 6 Option A (Cont'd)

Mexico Facilities

Project Cost	
	34 MGD Facility Scaled down from Alt 4A[1,2]
Public Law Treatment Plant	$46,932,581
Influent Pump Station	$5,503,991
Influent Conveyance	$16,461,212
Effluent Conveyance	$16,968,825
Engr/Legal/Admin	$10,303,993
Total Project Costs in Mexico	$96,170,602
Annual Operating Cost (US$/year)	
Pump Station/ Pipelines to Public Law Treatment Plant (34mgd)	$1,842,826
Public Law Treatment Plant	4,600,000
Total Operating Cost	6,442,826
Total Capital Cost ($US) in Mexico =	**$96,170,602**
Total Annual O&M ($US) in Mexico =	**$6,442,826**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74

2. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

	Escalated to 2004 US$[1]
Total Capital Cost of Alternative 6 ($US)	**$122,890,248**
Total Annual Cost of Alternative 6 ($US)	**$15,655,223**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74

Cash Flow Summary (Alt 6)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$122,890,248		$122,890,248	$122,890,248
1		$15,655,223	$15,968,328	$15,064,460
2		$15,655,223	$16,287,694	$14,495,990
3		$15,655,223	$16,613,448	$13,948,972
4		$15,655,223	$16,945,717	$13,422,595
5		$15,655,223	$17,284,632	$12,916,082
6		$15,655,223	$17,630,324	$12,428,683
7		$15,655,223	$17,982,931	$11,959,676
8		$15,655,223	$18,342,589	$11,508,367
9		$15,655,223	$18,709,441	$11,074,089
10		$15,655,223	$19,083,630	$10,656,199
11		$15,655,223	$19,465,303	$10,254,079
12		$15,655,223	$19,854,609	$9,867,132
13		$15,655,223	$20,251,701	$9,494,788
14		$15,655,223	$20,656,735	$9,136,494
15		$15,655,223	$21,069,869	$8,791,720
16		$15,655,223	$21,491,267	$8,459,957
17		$15,655,223	$21,921,092	$8,140,714
18		$15,655,223	$22,359,514	$7,833,517
19		$15,655,223	$22,806,704	$7,537,913
20		$15,655,223	$23,262,838	$7,253,463
Total ($US)	**$122,890,248**	**$313,104,467**	**$510,878,614**	**$337,135,138**

Table F-16. Alternative 6 Option B

Alternative 6B: Secondary Treatment in the United States and in Mexico (Based on 25 MGD Peak plus Equalization Tank)

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=25 ; SABWTP=25 ; Public Law=34 ; SBOO=59 ; PCL=25 ; Punta Bandera=25

US Facilities (Activated Sludge)

SBIWTP Primary Treatment Facility

Capital Cost[1] (2004 $US)	$0
Annual O&M[2] ($US/Year)	$5,000,000
NPDES Permit and Oceanographic Monitoring ($US/Year)	$600,000

1. No capital costs are included for the SBIWTP and SBOO since they are existing and significant modification is not required.
2. Do not reduce O&M cost since advanced primary treatment will continue per Reference 1.

Capital Cost of 25-mgd Secondary Activated Sludge Facilities in US[1,2,8]

Item	Structure[3]	Equipment[4]	Subtotal	Engineering Legal & Admin. 25%	Total Capital Cost	Total Capital Cost escalated to 2004 US$[7]
Activated Sludges[5]	$17,559,000	$9,046,000	$26,605,000	$6,651,000	$33,256,000	$41,043,351
Secondary Sedimentation	$9,905,000	$6,071,000	$15,975,000	$3,994,000	$19,969,000	$24,645,016
Dissolved Air Flotation	$1,075,000	$879,000	$1,954,000	$488,000	$2,442,000	$3,013,828
Sludge Storage	$1,245,000	$438,000	$1,684,000	$421,000	$2,105,000	$2,597,915
Standby Power	$222,000	$787,000	$1,009,000	$252,000	$1,261,000	$1,556,281
Support Facilities[6]	$4,857,000	$994,000	$5,851,000	$1,463,000	$7,314,000	$9,026,674
Equalization Facilities	$3,125,000	$439,000	$3,564,000	$891,000	$4,455,000	$5,498,200
TOTALS ($US)	$37,988,000	$18,654,000	$56,642,000	$14,160,000	$70,802,000	$87,381,264

Notes:
1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for August 1997 of 6631.
2. Construction costs include "Contractors Operations Costs", taxes, and contractor's profits. "Contractors Operation costs" include bonds, permits, insurance, mobilization, staffing, running the project, coordination, temporary facilities, etc
3. Structure includes grading, concrete, site civil and mechanical such as piping
4. Equipment includes metals, finishes, wood and plastics, equipment, instrumentation and control I &C and electrical.
5. Activated sludge includes activated sludge tanks with anoxic selectors and a blower facility with 4 blowers.
6. Support facilities include extension of yard piping, power and site work related to the construction of the proposed facilities
7. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74
8. Cost for land not included since plant would be constructed on land already owned and part of the SBIWTP site.

Annual Operating Costs for Secondary Train[1,2,3]

	Secondary Treatment[5]	Equalization Basin	Solids Treatment[6,7]	Total Operating Cost	Total Operating Cost escalated to 2004 US$[8]
O&M for secondary activated sludge ($US)	$2,466,000	$33,000	$2,817,000	$5,316,000	$6,560,815

Notes:
1. All operating costs are relative to August 1997.
2. The cost of power is estimated at $0.10/kWh
3. Labor is estimated at an average rate of $61,060 per year including salary burden for 2080 annual hours of work.
4. Not Used
5. Includes all costs of secondary treatment including thickening of waste activated sludge and the annualized cost of sludge removal from ponds.
6. Includes the cost of sludge thickening, dewatering, and treatment using lime stabilization, but does not include the cost of thickening of waste activated sludge or the cost of sludge removal from ponds.
7. Does not include the cost of sludge disposal in Mexico
8. Total capital cost adjusted to the ENR Construction Cost Index for Los Angeles for November 2004 of 8183.74

Total Capital Cost ($US) in USA =	$87,381,264
Total Annual O&M ($US) in USA =	$12,160,815

Table F-16. Alternative 6 Option B (Cont'd)

Mexico Facilities

Project Cost	
	34 MGD Facility Scaled down from Alt 4A[1,2]
Public Law Treatment Plant	$46,932,581
Influent Pump Station	$5,503,991
Influent Conveyance	$16,461,212
Effluent Conveyance	$16,968,825
Engr/Legal/Admin	$10,303,993
Total Project Costs in Mexico	$96,170,602
Annual Operating Cost (US$/year)	
Pump Station/ Pipelines to Public Law Treatment Plant (34mgd)	$1,842,826
Public Law Treatment Plant	4,600,000
Total Operating Cost	6,442,826
Total Capital Cost ($US) in Mexico =	**$96,170,602**
Total Annual O&M ($US) in Mexico =	**$6,442,826**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74
2. Cost scaled using a ratio of costs for equivalent plants sized for each of the design flows. The cost for each plant used to determine the ratio was calculated using EPA published cost curves for wastewater treatment unit processes.

	Escalated to 2004 US$[1]
Total Capital Cost of Alternative 6 ($US)	**$183,551,866**
Total Annual Cost of Alternative 6 ($US)	**$18,603,641**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74

Cash Flow Summary (Alt 6)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$183,551,866		$183,551,866	$183,551,866
1		$18,603,641	$18,975,713	$17,901,616
2		$18,603,641	$19,355,228	$17,226,084
3		$18,603,641	$19,742,332	$16,576,043
4		$18,603,641	$20,137,179	$15,950,532
5		$18,603,641	$20,539,922	$15,348,625
6		$18,603,641	$20,950,721	$14,769,432
7		$18,603,641	$21,369,735	$14,212,095
8		$18,603,641	$21,797,130	$13,675,789
9		$18,603,641	$22,233,073	$13,159,722
10		$18,603,641	$22,677,734	$12,663,128
11		$18,603,641	$23,131,289	$12,185,274
12		$18,603,641	$23,593,915	$11,725,453
13		$18,603,641	$24,065,793	$11,282,983
14		$18,603,641	$24,547,109	$10,857,210
15		$18,603,641	$25,038,051	$10,447,504
16		$18,603,641	$25,538,812	$10,053,258
17		$18,603,641	$26,049,588	$9,673,890
18		$18,603,641	$26,570,580	$9,308,838
19		$18,603,641	$27,101,992	$8,957,561
20		$18,603,641	$27,644,031	$8,619,540
Total ($US)	**$183,551,866**	**$372,072,813**	**$644,611,793**	**$438,146,441**

Table F-17. Alternative 7

Alternative 7: SBIWTP Closure/Shutdown

Year: 2023

Average Flows (mgd) : Total=84 ; SBIWTP=0 ; SABWTP=25 ; PCL=25 ; RCL=59 ; SBOO=0 ; Pt. Band.=84

SBIWTP Primary Treatment Facility	
O&M (Mothballing and security services of plant)[1]	$600,000

1. Does not consider agreements for sharing the use of the outfall with the City of San Diego.

RCL Improvement Cost	
5900 HP Pump Station (59 mgd)[2]	$14,807,284
RCL pipelines construction[1] (Dia=1.8m)	$25,959,991
Engineering, supervision and project administration, 12%	$4,892,073
Pump Station O&M[2]	$5,055,273
Pipelines O&M at 1% of capital cost (US$/year)	$259,600

Total Capital Cost ($US) =	**$45,659,348**
Total Annual O&M ($US) =	**$5,914,873**

1. Construction costs adjusted to the ENR Construction Cost Index for Los Angeles for Nov. 2004 of 8183.74

Cash Flow Summary (Alt 7)

Inflation Rate = 2 %

Discount Rate = 6 %

Year	Structure and Equipment	Operating Costs	Total Annual Outlays	Present Value
0	$45,659,348		$45,659,348	$45,659,348
1		$5,914,873	$6,033,170	$5,691,670
2		$5,914,873	$6,153,833	$5,476,890
3		$5,914,873	$6,276,910	$5,270,215
4		$5,914,873	$6,402,448	$5,071,339
5		$5,914,873	$6,530,497	$4,879,967
6		$5,914,873	$6,661,107	$4,695,818
7		$5,914,873	$6,794,329	$4,518,617
8		$5,914,873	$6,930,216	$4,348,103
9		$5,914,873	$7,068,820	$4,184,024
10		$5,914,873	$7,210,197	$4,026,136
11		$5,914,873	$7,354,401	$3,874,206
12		$5,914,873	$7,501,489	$3,728,010
13		$5,914,873	$7,651,518	$3,587,330
14		$5,914,873	$7,804,549	$3,451,959
15		$5,914,873	$7,960,640	$3,321,697
16		$5,914,873	$8,119,852	$3,196,350
17		$5,914,873	$8,282,249	$3,075,733
18		$5,914,873	$8,447,894	$2,959,667
19		$5,914,873	$8,616,852	$2,847,982
20		$5,914,873	$8,789,189	$2,740,511
Total ($US)	**$45,659,348**	**$118,297,450**	**$192,249,510**	**$126,605,572**

APPENDIX G
COURT ORDER SETTING COMPLIANCE SCHEDULE

FILED

DEC - 6 2004

CLERK, U.S. DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
BY DEPUTY

IN THE UNITED STATES DISTRICT COURT

FOR THE SOUTHERN DISTRICT OF CALIFORNIA

PEOPLE OF THE STATE OF CALIFORNIA, Ex Rel. THE REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, Plaintiff, v. ARTURO DURAN, an individual in his capacity as Commissioner of the INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES SECTION, et al., Defendants.	Case No. 01-CV-0270-BTM(JFS) ORDER SETTING COMPLIANCE SCHEDULE

On December 5, 2003, this Court granted Plaintiff California Regional Water Quality Control Board, San Diego Region's ("Regional Board") Motion For Summary Judgment re: liability of Defendant International Boundary and Water Commission, United States Section ("USIBWC") in the above referenced action. The Court found Plaintiff had established liability against the USIBWC under the Federal Water Pollution Control Act ("Clean Water Act"), and the California Porter-Cologne Water Quality Control Act ("Porter-Cologne Act") based upon USIBWC's ongoing discharges from the International Wastewater Treatment Plant ("IWTP") through the South Bay Ocean Outfall. The Court found that USIBWC's discharges violate, and will continue to violate, effluent limitations based on secondary treatment requirements, and for acute and chronic toxicity, contained in waste discharge requirements for the IWTP , Order No. 96-50, as amended [National

Pollutant Discharge Elimination System Permit No. CA 0108928[("Order No. 96-50") issued by the Regional Board.

The parties have submitted a statement of stipulated facts that includes a statement that presently, advanced primary treatment of sewage from Mexico at the IWTP provides substantial mitigation of the previous uncontrolled discharges of raw, untreated sewage to waters of the United States. Any action by the Court at this time that would require USIBWC to discontinue the existing level of advanced primary treatment at the IWTP would be detrimental to public health, water quality, and the environment despite the fact that USIBWC will continue to violate effluent limits based on secondary treatment and effluent limits for toxicity until USIBWC provides secondary treatment or takes alternative measures to avoid violation of Order No. 96-50. Therefore, this Court finds that it is in the interest of the public health, water quality, and environment of the state of California to establish a schedule by which USIBWC can come into compliance with the effluent limitations contained in Order No. 96-50.

Accordingly, it is **ORDERED** that:

1. Plaintiff is entitled to an injunction under both federal and state law compelling USIBWC to comply with the effluent standards and limitations based on secondary treatment and relating to acute and chronic toxicity contained in Order No. 96-50.

2. USIBWC shall achieve full compliance with all effluent standards and limitations contained in Order No. 96-50 not later than September 30, 2008. USIBWC shall achieve compliance by providing secondary treatment of its effluent, or otherwise meeting the requirements contained in Order No. 96-50.

3. USIBWC shall publish the Draft Supplemental Environmental Impact Statement ("SEIS") for Clean Water Act Compliance for the IWTP not later than December 31, 2004, and shall publish the Final SEIS not later than August 1, 2005.

4. USIBWC shall issue a Record of Decision not later than October 1, 2005 defining the project(s), and identifying one or more feasible alternative projects, that USIBWC shall implement to achieve compliance with the effluent standards and limitations in Order No. 96-50.

///

5. USIBWC shall, on or before October 15, 2005, generate a "Critical Path Schedule" for its project(s) utilizing Critical Path Management Method ("CPMM") software to define, track, and report the design and construction phases of the project(s) selected in the Record of Decision to achieve compliance. The Critical Path Schedule for the project(s) shall include a listing and description of design and construction tasks that are required to construct, operate and manage the selected project(s) to completion on a day-to-day basis. Each task shall be described and assigned a duration in days, an early start and late start date, an early finish and late finish date, and shall be depicted in a graphic logic network representation to clearly show the tasks' relationships to the overall project and the Critical Path Schedule for completion of the project. A sufficient number of tasks shall be included in the listing to ensure that the current status of the overall project(s) shall be clearly depicted on a daily basis, so that interested persons can determine whether the project is ahead of, or behind, schedule, and the reasons for any deviations from the Critical Path Schedule. The Critical Path Schedule shall be kept up to date at least daily to ensure that it reflects the projected early and late start and finish dates for all tasks and for the project(s) accurately.

(a) The Critical Path Schedule shall include the following deadlines:

i. Award contract(s) for design and construction of facilities and notice to proceed with construction of facilities not later than December 19, 2005.

ii. Initiate design phase, if necessary, not later than December 19, 2005.

iii. Commence construction phase of project(s) not later than September 15, 2006.

iv. Complete construction phase of project(s) not later than August 24, 2008.

v. Achieve full compliance with applicable effluent standards and limitations not later than September 30, 2008.

6. USIBWC shall submit the Critical Path Schedule to the Court for purposes of reviewing the schedule's reasonableness.

7. If the Critical Path Schedule developed by USIBWC reveals that USIBWC can accomplish the tasks set forth in paragraph 5 above materially sooner than the deadlines delineated,

the Regional Board may ask the Court to exercise its discretion to impose earlier deadlines.

8. As soon as the Critical Path Schedule is established and until the selected project(s) is/are completed, USIBWC shall provide to the Regional Board and the Court internet-web-based real-time access to the Critical Path Schedule and all CPMM information developed or relied upon by USIBWC.

9. USIBWC shall rely on the CPMM to direct and manage the project(s) needed to achieve compliance with Order 96-50 and shall utilize expeditious project management principles to promote completion of the project(s) and compliance with Order No. 96-50 in the shortest possible time. The tasks and dates contained in the Critical Path Schedule shall serve as an integral means for ensuring compliance with the deadlines set forth in paragraph 5 above, or with any modifications thereafter imposed by the Court.

10. If USIBWC fails to meet dates contained in the Critical Path Schedule, USIBWC shall promptly make adjustments to return the project(s) to schedule. If USIBWC fails to meet the dates contained in the Critical Path Schedule that might cause USIBWC to miss any of the deadlines set forth in paragraph 5 above, or with any modifications imposed by the Court, USIBWC shall, within 10 days, meet and confer with the Regional Board regarding adjustments to the schedule of work to meet the deadlines in paragraph 5 above. USIBWC and the Regional Board shall immediately notify the Court of any scheduled meet and confer as described above and thereafter shall notify the Court of the outcome of the meet and confer. If, after meeting and conferring with the Regional Board as described above, the Regional Board determines that USIBWC will fail to meet, or if USIBWC fails to meet, any of the deadlines set forth in paragraph 5 above, or any modifications imposed by the Court, the Regional Board can seek relief from the Court, including but not limited to, coercive penalties. USIBWC can assert any and all defenses.

11. USIBWC has consistently achieved removal of not less than 75 percent of TSS from the wastewater treated at the IWTP using advanced primary treatment. USIBWC shall remove not less than 75 percent of TSS at any time as required by applicable effluent limitations. USIBWC shall continue to manage the advanced primary treatment process at IWTP to optimize TSS removal above 75 percent while working to complete the project(s) needed for USIBWC to achieve compliance with

Order No. 96-50. Within 60 days from the entry of the Court's order, USIBWC shall commence an optimization study utilizing an independent third party to determine how additional TSS can be removed from the effluent from the IWTP. If the optimization study reveals that additional TSS can be removed from the effluent, USIBWC and the Regional Board shall meet and confer regarding methods for achieving additional TSS removal. If the parties cannot agree, the Regional Board can request any appropriate relief from the Court.

12. Plaintiff is a substantially prevailing party in this lawsuit and USIBWC shall pay Plaintiff reasonable attorneys' fees and costs.

13. The claim for coercive penalties is by stipulation of the parties withdrawn without prejudice and may be raised as set forth in paragraph 10.

14. This Order shall be a final judgment for equitable relief for all of Plaintiff's claims. The Court retains jurisdiction to enforce the terms of this Order.

IT IS SO ORDERED. The clerk shall enter this as a final judgment

Date: 12-06-2004

The Honorable Barry T. Moskowitz
United States District Judge

I hereby attest and certify on 12-6-04
That the foregoing document is a full, true and correct copy of the original on file in my office and in my legal custody.

CLERK, U.S. DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

By