PALO VERDE PATHOGEN TMDL PROBLEM STATEMENT

This Problem Statement includes a description of: (a) violated Water Quality Objectives that prompted TMDL development, (b) watershed characteristics, and (c) impairments caused by pathogen loading.

A. WATER QUALITY OBJECTIVES

Water quality standards (WQS), pursuant to 40 CFR 130.2(d) and California Water Code (CWC) 13241, consist of beneficial uses and the water quality criteria (a.k.a. water quality objectives in the CWC) based on such uses. WQS adopted for the Colorado River Basin Region are contained in the Water Quality Control Plan for the Colorado River Basin Region (CRWQCB, 1994). The WQS for the Palo Verde Lagoon and Outfall Drain are comprised of the beneficial uses of water and the water quality objectives (WQOs). The WQOs are either numerical or narrative and are designed to protect the most sensitive beneficial uses. In the Palo Verde Lagoon and Outfall Drain, the most sensitive designated beneficial uses to be addressed in the Pathogen TMDL include: contact and non-contact recreation (REC I and REC II); warm freshwater habitat (WARM); wildlife habitat (WILD); and preservation of rare, threatened, and endangered species (RARE).

Pathogens are present in the Palo Verde Lagoon at levels that violate numeric water quality objectives established by the Regional Board to protect beneficial uses. These violations of water quality objectives indicate that the Palo Verde Lagoon and Outfall Drain beneficial uses are impaired. Tables 1 and 2 summarize water quality objectives for the Palo Verde Lagoon and Outfall Drain beneficial uses.

Table 1: Water Quality Objectives

Parameter	Indicator Parameter	Water Quality Objective			
		30-Day Geometric Mean	30-Day Log Mean[a]	Maximum	Other
Bacteria	*E. coli*	126 MPN[b]/100 ml	--	400 MPN/100 ml	
	Enterococci	33 MPN/100 ml	--	100 MPN/100 ml	
	Fecal Coliform	--	200 MPN/100ml	--	[c]

a. Based on a minimum of no less than 5 samples equally spaced over a 30-day period.
b. Most probable number.
c. No more than 10% of total samples during any 30-day period shall exceed 400 MPN/100 ml.

Source: California Regional Water Quality Control Plan for the Colorado River Basin Region 1994.

Table 2: Palo Verde Lagoon and Outfall Drain Beneficial Uses

Designated Beneficial Uses	Description
Water Contact Recreation (REC I) [a]	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.

Designated Beneficial Uses	Description
Water Non-Contact Recreation (REC II) [a]	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
Warm Freshwater Habitat (WARM)	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat (WILD)	Uses of water that support terrestrial ecosystems including but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
Preservation of Rare, Threatened, or Endangered Species (RARE)	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

a. Unauthorized use within the Riverside County portion of flow.

Source: California Regional Water Quality Control Plan for the Colorado River Basin Region 1994.

B. WATERSHED CHARACTERISTICS

The Palo Verde Lagoon and Outfall Drain are located in the Palo Verde Valley that lies in both Riverside and Imperial Counties of California. The area is 29 miles long and 15 miles across at its widest point (USDA 1974). The valley is bounded on the north by the Big Maria Mountains, on the west by the Palo Verde Mesa, and on the south and east by the Colorado River (USGS Salton Sea Map 1:25,000). The valley has an irrigation system of canals, levees, drains, and a lagoon around which the community of Palo Verde is centered.

Agriculture in the valley is sustained by irrigation water provided by the Palo Verde Irrigation District (PVID). Water is diverted from the Colorado River at the Palo Verde Diversion Dam. Large acreages of land in the valley are used to grow high-value row crops such as melons, cotton, alfalfa, and produce vegetables (USDA 1974). Drainage is provided by a 150 mile system of open drains that discharge into the Palo Verde Outfall Drain. The outfall drain discharges into an old channel of the Colorado River and enters the present river channel at the Cibola National Wildlife Refuge. The flow in the outfall drain ranges from approximately 350 cfs to approximately 800 cfs (PVID 1980).

The Palo Verde Valley floor is made up of deposited alluvium. The soils are generally level, moderate to well drained sandy loams and loamy sands. Average annual precipitation in the valley is usually less than 4 inches while evapotranspiration totals about 48 inches per year using the Thornthwaite method (USDA 1974).

Table 3: Soil Associations in the Palo Verde Valley

1	Rositas-Gilman	Nearly level	Somewhat excessively drained and well-drained	Fine sands, fine sandy loans, and silty clay loams
2	Cibola-Ripley-Indio	Nearly level	Well-drained	Fine sandy loams, very fine sandy loams, or silty clay loams
3	Imperial-Holtville Meloland	Nearly level	Well-drained and moderately well-drained	Fine sandy loams, silty clay loams, and silty clays

Source: USDA Soil Conservation Service. 1974. Soil Survey of Palo Verde Area, California.

C. IMPAIRMENT BY PATHOGENS

The Palo Verde Outfall Drain is listed on the state's 303(d) list as impaired by pathogens of an unknown source. This violation of the standards set forth in the California Regional Water Quality Control Board, Colorado River Basin Region's Basin Plan is indicative of a public health hazard and the impairment of the Palo Verde Lagoon and Outfall Drain's beneficial uses. For these reasons, the Palo Verde Outfall Drain is targeted for development and implementation of a TMDL that addresses pathogens. Sampling events to support source analysis and TMDL development are scheduled for 2002.