



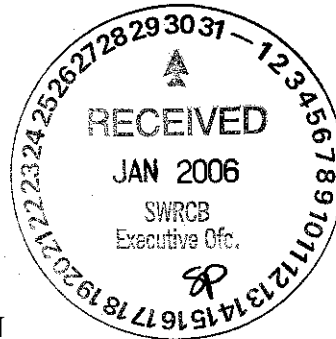
**California Regional Water Quality Control Board
Colorado River Basin Region**



Alan C. Lloyd, Ph.D.
Agency Secretary

73-720 Fred Waring Drive, Suite 100, Palm Desert, California 92260
(760) 346-7491 • Fax (760) 341-6820
<http://www.waterboards.ca.gov/coloradoriver>

Arnold Schwarzenegger
Governor



303 (d) Deadline: 1/31/06

TO: Ken Harris, Chief
TMDL Section
SWRCB, DWQ

FROM: Robert Perdue
Executive Officer
**COLORADO RIVER BASIN
REGIONAL WATER QUALITY CONTROL BOARD**

DATE: January 30, 2006

SUBJECT: Water Body Fact Sheets For the Colorado River Basin Region Supporting Listing and Delisting Recommendations for the 2006 State CWA 303(d) List

Regional Board staff has reviewed the subject water body fact sheets published on the State Board website on September 30, 2005 as part of the notice for public workshops to revise the federal Clean Water Act (CWA) Section 303(d) List of water quality limited segments for California. Regional Board staff disagrees with several 2006 303(d) listings recommended for the Colorado River Basin Region specifically:

- Listing the Colorado River for manganese, and
- Listing the All American Canal (AAC) for specific conductance (SC), total dissolved solids (TDS), and sulfates.

Concerns with the above proposed 2006 listings were articulated to State Board staff on several occasions (August 29, and September 1, 8, 16, 19, and 21, 2005), and to members of State Board during the workshop in Pasadena on January 5, 2006. This letter reiterates these concerns, provides further information to support our perspective, and new information to support delisting Palo Verde Outfall Drain, which was listed for bacteria indicators in 1993.

**LISTING THE COLORADO RIVER FOR MANGANESE FROM THE
IMPERIAL RESERVOIR TO CALIFORNIA/MEXICO BORDER**

State Board staff recommends the above listing based on water quality data for Reservation Main Drain 4 (727CRRMD4), where two samples exceeded the maximum contaminant level (MCL) for manganese, and the allowed frequency in Table 3.1 of the listing policy.

Regional Board staff disagrees with this listing because Reservation Main Drain 4 is not located on the Colorado River. Reservation Main Drain 4 (727CRRMD4) is part of the Bard Valley Drains, which is within the Lower Colorado River Basin, but not the lower Colorado River. Beneficial uses for the Bard Valley Drains include REC I, REC II, WARM, and WILD. Section 6.1.5 of the State's 303(d) listing policy (State Water Resources Control Board, 2004) specifically states:

only data from the water segment itself can be used to assess its water quality standards attainment, and whether to list or delist that particular water segment.

**LISTING THE ALL AMERICAN CANAL (AAC) FOR SPECIFIC
CONDUCTANCE (SC), TOTAL DISSOLVED SOLIDS (TDS), AND SULFATES**

State Board staff recommends the above listing based on water quality data for the All American Canal (AAC) collected by the Imperial Irrigation District (IID), which exceeds the recommended Secondary Maximum Contaminant Level (MCL) in:

- 65 of 71 water quality samples for SC;
- 70 of 71 water quality samples for TDS, and
- 53 of 66 water quality samples for sulfate.

Secondary MCLs for these constituents shall not be exceeded in the water supplied to the public, because these constituents may adversely affect the taste, odor or appearance of drinking water (California Code of Regulations, Title 22, Section 64449). The above exceedance frequencies surpass that allowed in Tables 3.1 and 3.2 of the State 303(d) listing policy, and are the only basis for State Board staff's recommendation for CWA 303(d) listing. Secondary MCLs for SC, TDS, and sulfate are provided in Table 1 below for your information.

**Table 1: Secondary Maximum Contaminant Levels
California Code of Regulations (CCR) Title 22**

Constituent	Recommended	Upper	Short Term
Total Dissolved Solids (mg/l)	500	1,000	1,500
Specific Conductance, micromhos	900	1,600	2,200
Sulfate (mg/l)	250	500	600

Please note:

- *Constituent concentrations lower than the **Recommended** contaminant level are desirable for a higher degree of consumer acceptance;*
- *Constituent concentrations ranging to the **Upper** contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable water; and*
- *Constituent concentrations ranging to the **Short Term** contaminant level are acceptable only for existing systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources (CCR, Title 22, Section 64449 (f)).*

Regional Board staff disagrees with the placement of AAC on the State CWA 303(d) list for SC, TDS and sulfate for reasons discussed below.

Background Information: The Colorado River originates in the Rocky Mountains in northern Colorado, flows south/southwest through Colorado, Utah, Arizona, separates Nevada from Arizona, and then Arizona from California, and finally flows into Mexico, emptying into the Gulf of California. Treaties and agreements regulate the River's use.

The AAC is an extension of the Colorado River constructed for the sole purpose of delivering water from the Colorado River to Imperial and Coachella Valleys for agricultural and municipal use. Currently the canal diverts 3.1 million acre-feet per year of water from the Colorado to nine Imperial Valley cities, and 500,000 acres of agricultural land in Imperial and Coachella Valleys. Ninety eight percent of this water is used to irrigate crops mostly in Imperial Valley. Only two percent supplies drinking water to Imperial Valley cities. Annual drinking water reports issued by IID to Imperial County residents and the Department of Health Services clearly indicate that water from the Colorado River conveyed by the AAC achieves all Primary and/or Secondary MCLs, and is of sufficient quality for municipal/domestic supply without treatment to reduce SC, TDS, or sulfate. In summary:

- the quality of the water in the AAC is virtually identical to that in the Colorado River at the Imperial Dam, which is where water from the Colorado is diverted into AAC;
- the quality of the water in the AAC satisfies secondary MCLs (i.e., is within the allowable limits), for SC, TDS, and sulfate, and
- pursuant to the State's 303(d) listing policy, surface waters should be placed on the 303 (d) list if a TMDL will resolve the impairment. Developing and implementing TMDLs for the AAC will not be possible without the assistance and cooperation of states upstream of California that discharge pollutants to the Colorado River.

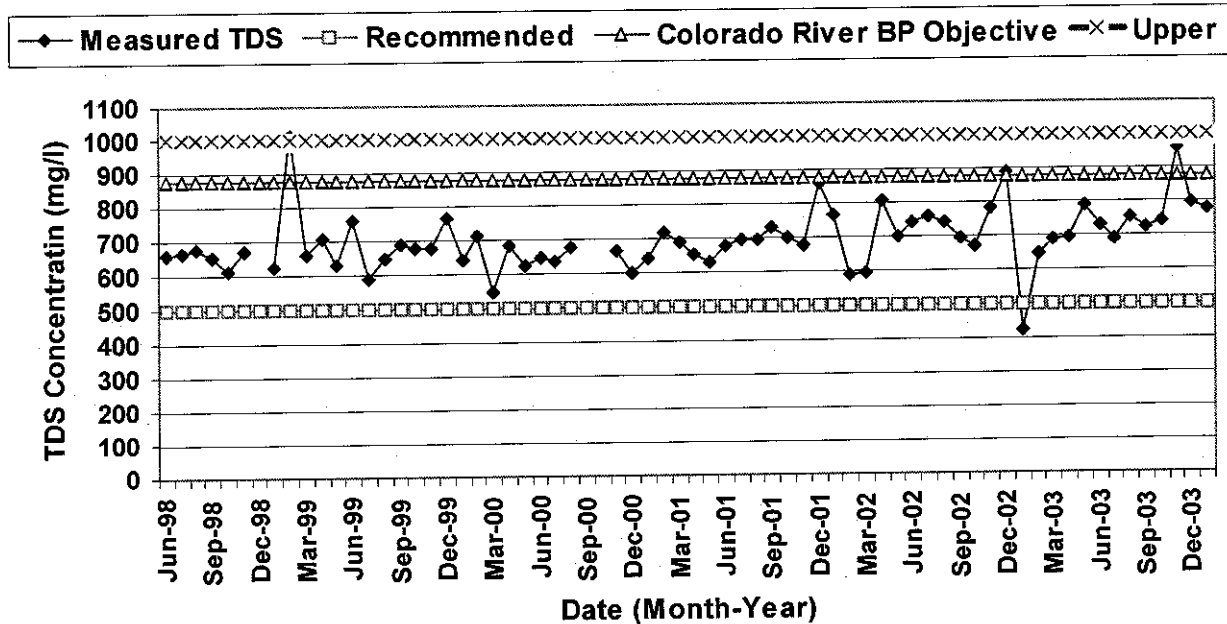
Specific Conductance (SC): SC measures the ability of water to conduct an electrical current. SC increases as the concentration of inorganic dissolved solids increase (e.g., chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium, iron, aluminum, etc.). TDS is a measure of dissolved solids. TDS can be determined directly from a water sample, or calculated by multiplying SC by a factor between 0.55 and 0.9, which is empirically determined (USEPA, 1997). Listing the AAC for both SC and TDS is redundant given that SC and TDS are different means of evaluating the same parameter (i.e., ionic concentration).

Total Dissolved Solids (TDS): In 1975, the Seven States Colorado Salinity Control Forum developed salinity (TDS) water quality standards for three locations on the lower Colorado River. These standards were adopted by California and the other Basin States, and approved by USEPA. The water quality objective for TDS at Imperial Dam where water from the Colorado is diverted to AAC is 879 ppm or mg/l (Water Quality Control Plan, Colorado River Basin- Region 7, Chapter 3, Page 3-5), well within the 500 – 1000 mg/l secondary MCL range for TDS (California Code of Regulations, Title 22, Section 64449). This standard was based on historical water quality data from samples collected at Imperial Dam since 1950, which indicate TDS levels ranging from 500 to 900 mg/l, a concentration due largely to local geology, and climate.

The ACC is a manmade extension of the Colorado River constructed for the sole purpose of distributing water from the Colorado to Imperial and Coachella Counties. The TDS water quality objective for the Colorado at Imperial Dam (879 mg/l) also applies to the AAC, given that the source of water is the same.

Figure 1 below compares TDS data from IID to the TDS limits/objectives in the CCR, and the Colorado River Basin Water Quality Control Plan. Note that only three of the 71 water quality samples collected from the AAC by IID exceeded 879 mg/l TDS, and that only one of the 71 samples exceeded 1000 mg/l. This is not a sufficient number of exceedances to justify listing according to Table 3.2 in the 303(d) listing policy. Generally, surface waters on the CWA 303(d) List are impaired to the extent that one or more beneficial uses are lost. Like the Colorado River, this is clearly not the case for the AAC, which supplies drinking water to nine Imperial Valley cities without treatment to reduce TDS.

Figure 1: All American Canal TDS Data

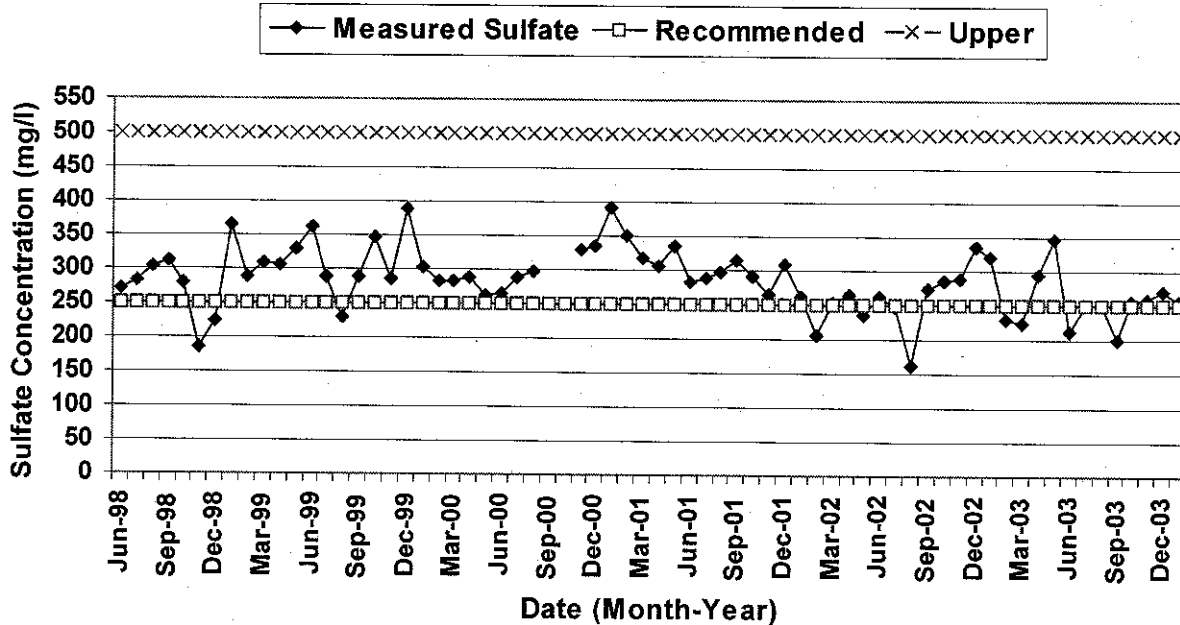


Sulfate: Sulfate (SO₄) is produced from the oxidation of elemental sulfur, sulfide minerals, or organic sulfur. Sulfate causes adverse health effects in humans and animals when ingested through drinking water in high doses. USEPA and the Center for Disease Control Prevention (CDC) conducted a study to determine a dose-response relationship for human health effects following exposure to sulfate in drinking water. Based on this study, the EPA and CDC jointly concluded that it is unlikely any adverse health effects will result from sulfate concentrations in drinking water below 600 mg/l for adults. The results of the EPA/CDC study was discussed by a panel of experts in September 1998, who concluded that a health advisory be issued in areas where sulfate concentrations in drinking water exceed 500 mg/l (USEPA, 2003).

No sample collected from the AAC exceeds 500 mg/l, the health reference level suggested by the USEPA, and the upper secondary MCL level (California Code of Regulations, Title 22, Section 64449).

In fact, 53 of 66 water quality samples collected from the AAC had sulfate levels within the secondary MCL range of 250 to 500 mg/l, and the remaining had less than 250 mg/l sulfate (California Code of Regulations, Title 22, Section 64449; Figure 2). Like TDS, sulfate concentrations in the Colorado River result largely from local geology, and climate.

Figure 2: All American Canal Sulfate (SO4) Data



REQUEST TO DELIST PALO VERDE OUTFALL DRAIN FOR BACTERIA INDICATORS

Background Information: Palo Verde Outfall Drain (PVOD), a 16-mile water body, is located in Palo Verde Valley, California, in southern Riverside County and northern Imperial County (Figures 3 and 4). Palo Verde Valley is bounded on the north by the Big Maria Mountains, on the west by Palo Verde Mesa, and on the south and east by the Colorado River. The valley has an agricultural drain system administered by the Palo Verde Irrigation District (PVID) that diverts water from the Colorado River at Palo Verde Diversion Dam into 142 miles of open drains that discharge into PVOD. PVOD then discharges into an old channel of the Colorado River before joining the present river channel upstream of the Cibola National Wildlife Refuge.

PVOD was listed in 1993 for pathogen impairment due to high levels of total coliform bacteria, an organism that occurs abundantly in human and animal feces, and in soil. Subsequent studies by USEPA found that *E. coli* or enterococci are significantly better pathogenic indicators than total fecal coliform, and recommend using the water quality standard for either *E. coli* or enterococci to protect fresh water recreational use (USEPA 2002). This policy was incorporated into the Colorado River Basin Water Quality Control Plan, as well as the objectives for *E. coli* and enterococci promulgated by USEPA.

To develop the Palo Verde bacterial indicators TMDL, Regional Board staff collected water quality samples in the Palo Verde Lagoon in October 2000, January 2000, and June 2001 for bacterial analysis. Staff also collected water quality samples from the lagoon and drains tributary to the lagoon in June, July, August, November and December 2002, and in April 2003. Sampling was initially conducted (2000-2001) in the lagoon because water quality violations were first reported in that area, possibly due to the residences located along the Lagoon using septic systems for wastewater disposal. Samples were then obtained at the outlet of drains tributary to the lagoon. Table 2 lists sampling stations in PVOD only and number of observations obtained per station as of August 2002. Figure 3 shows stations listed in Table 2 and two additional stations (CO3 and PVD-1) from tributaries to the PVOD.

Figure 3: Palo Verde Valley

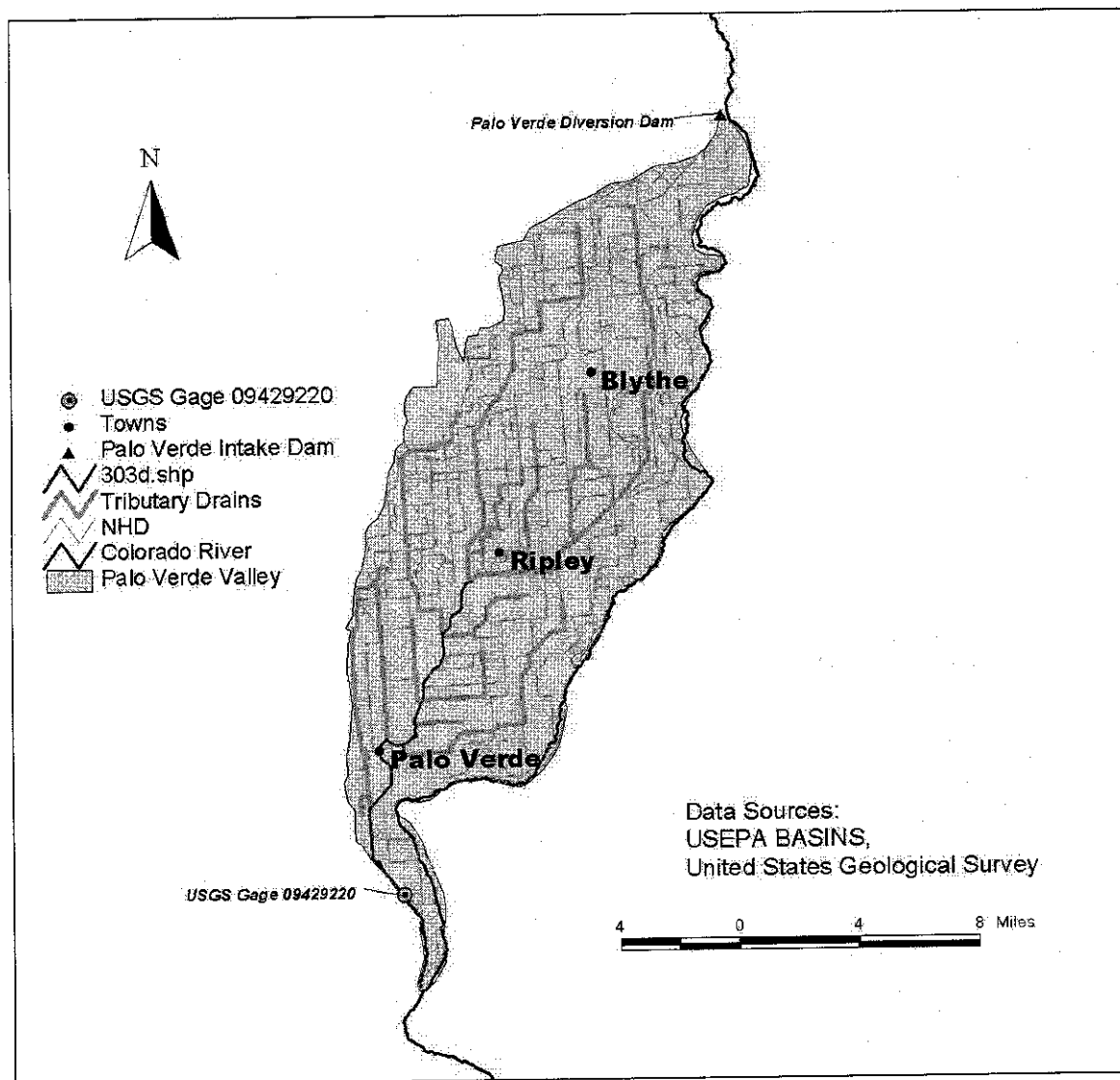


Figure 4: Palo Verde Outfall Drain Area

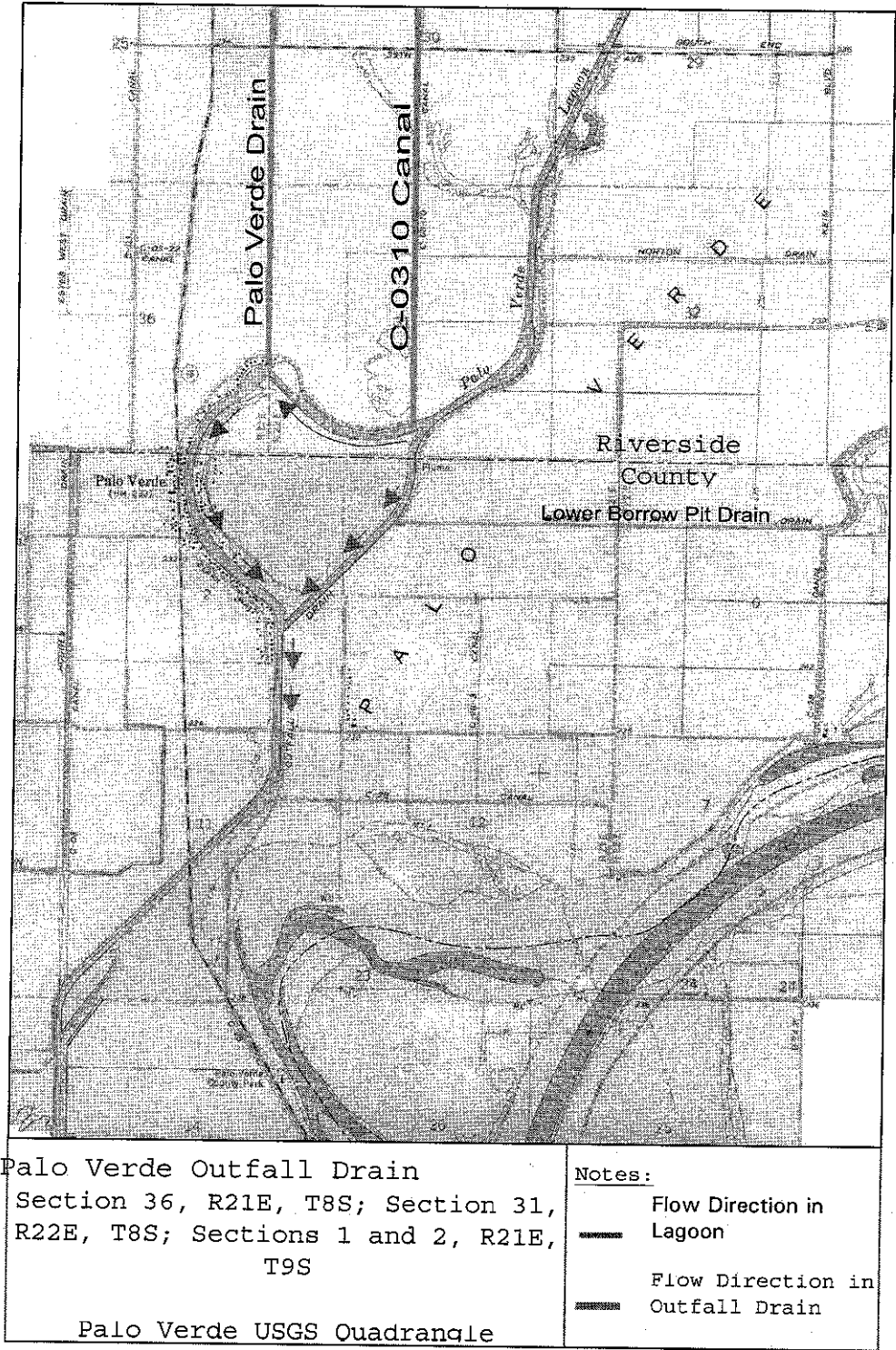
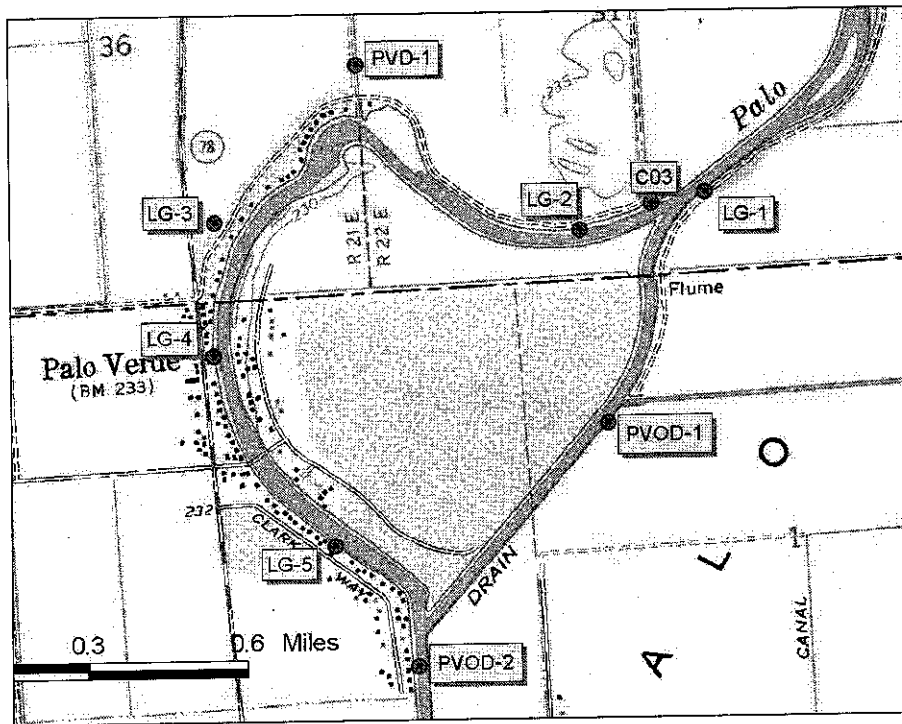


Table 2: Monitoring Stations and Number of Observations

Station ID	Location	# of observations
LG1	Upstream lagoon, 400 ft north from beginning of PVOD	6
LG2	Lagoon, 200 ft downstream from mixing zone of Lagoon and C-0310 Drain	6
LG3	PVL canal, 200 ft north Imperial-Riverside County line, in Riverside County	6
LG4	PVL canal, 200 ft south Imperial-Riverside County line, in Imperial County	6
LG5	PVL canal, 200 ft upstream PV Lagoon/PVO Drain junction	6
PVOD1	PVO Drain, 200 ft downstream LBPD and PVOD mixing zone	6
PVOD2	PVL canal, 200 ft downstream of Lagoon and PVOD mixing zone	6

Figure 5: Water Quality Stations Surrounding the Palo Verde Lagoon



Monitoring Results: USEPA and the Colorado River Basin Water Quality Control Plan recommend using the water quality standard for either E. coli or enterococci to protect fresh water recreational use. USEPA reviewed the data collected for developing this TMDL and recommended using the E. coli standard for PVOD because it indicates bacterial contributions from human sources (Dr. Andy Lincoff, microbiologist, USEPA Region 9, personal communication).

Forty-one water quality samples were collected from seven locations on PVOD from October 2000 to August 2002 (Table 3 and Figure 6). Only two of the 41 samples exceeded the E. coli WQO of 400 MPN/ 100 ml in our Region's Basin Plan. Section 4.2 of the Listing Policy states:

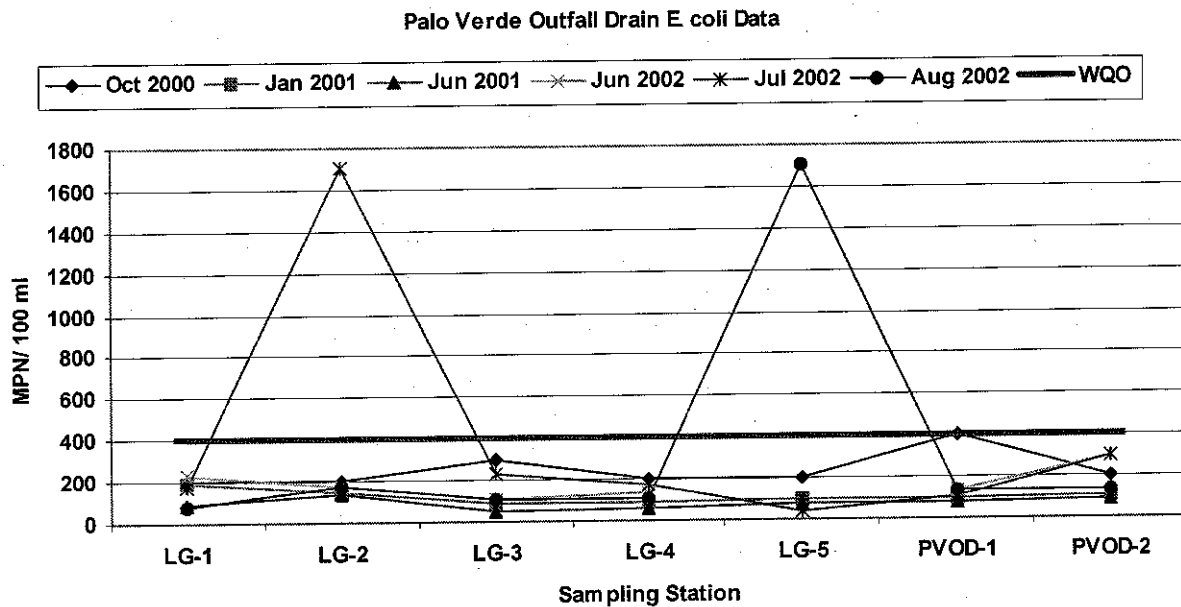
Using the binomial distribution, waters shall be removed from the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 4.2.

For a sample size ranging from 37 to 42, Table 4.2 of the listing policy requires delisting if the number of exceedances is equal to or less than six. Palo Verde has only two exceedances, and therefore should be delisted for bacterial indicator impairment.

Table 3: Palo Verde Outfall Drain E. coli Bacteria Data

Sampling Station	Oct 2000	Jan 2001	Jun 2001	Jun 2002	Jul 2002	Aug 2002	WQO
LG-1	200	190	87	230	170	80	400
LG-2	200	143	130	170	1700	170	400
LG-3	300	83	51	110	230	110	400
LG-4	200	83	60	130	170	110	400
LG-5	200	100	73		40	1700	400
PVOD-1	400	97	77	130	110	130	400
PVOD-2	200	110	90	300	300	130	400

Figure 6: Palo Verde Outfall Drain water quality E. coli data



In conclusion, if you have questions regarding our request to delist Palo Verde Outfall Drain for bacterial indicators, or not to list the Colorado River for manganese, or the AAC for salinity (either using SC or TDS) and sulfates, please call Joan Stormo at 760-776-8982 or Nadim Zeywar at 760-776-8942.

References:

California Code of Regulations, Title 22, Section 64449 (Secondary Maximum Contaminant Levels and Compliance). (<http://ccr.oal.ca.gov/>)

State Water Resources Control Board. 2004. Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List. State Water Resources Control Board, Regional Water Quality Control Board, California Environmental Protection Agency, Sacramento, CA. (http://www.waterboards.ca.gov/tmdl/303d_listing.html)

State Water Resources Control Board. September 2005. Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments. Division of Water Quality, State Water Resources Control Board, California Environmental Protection Agency, Sacramento, CA. (http://www.waterboards.ca.gov/tmdl/303d_update.html)

USEPA. July 2003. Contaminants Candidate List Regulatory Determination Support Document for Sulfate, Office of Water (4607M), Standard and Risk Management Division, EPA-815-R-03-16, July 2003

USEPA. November 1997. Volunteer Stream Monitoring: A Methods Manual. Office of Water 4503F. U.S. Environmental Protection Agency. EPA 841-B-97-003. (<http://www.epa.gov/volunteer/stream/index.html>)

USEPA. May 2002 Draft. Implementation Guidance for Ambient Water Quality Criteria for Bacteria. Office of Water (4305T). EPA-823-B-02-003

File: BP 303(d)