



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



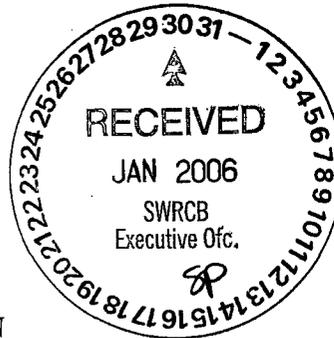
Alan C. Lloyd, Ph.D.
Agency Secretary

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<http://www.waterboards.ca.gov/coloradoriver>

Arnold Schwarzenegger
Governor

2nd-DG

71



303 (d) Deadline: 1/31/06

671

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 *F.S. 3229*
- Listing the All American Canal (AAC) for specific conductance (SC), total dissolved solids (TDS), and sulfates. *F.S. #s 2126(S.C.) 2125(TDS) 2238(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.

① →

~~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:

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:

2

- 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).

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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.

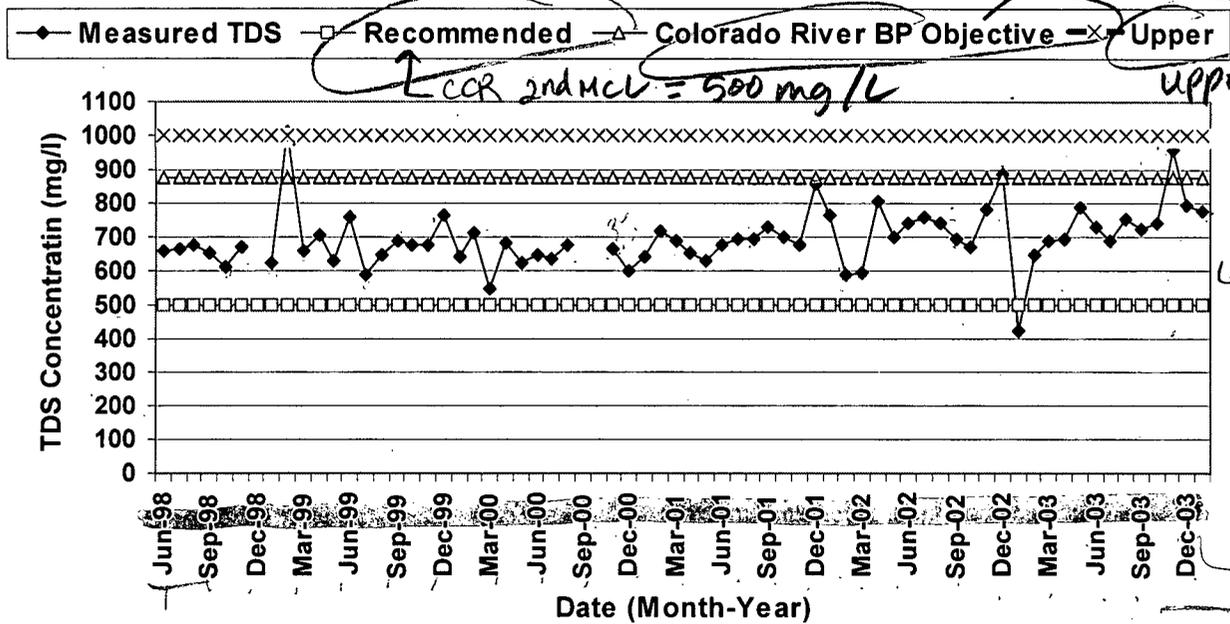
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3

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

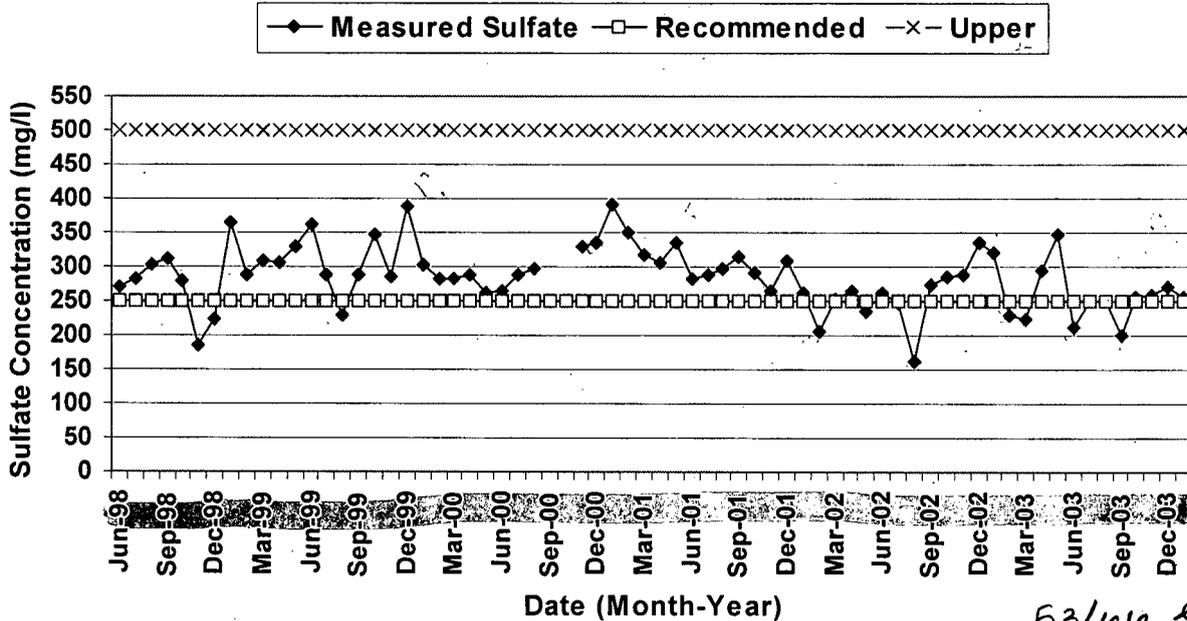


Sulfate: Sulfate (SO4) is produced from the oxidation of elemental sulfur, sulfide minerals, or organic sulfur. Sulfate causes adverse health effects in humans and animals when ingested through drinking water in high doses. USEPA and the Center for Disease Control Prevention (CDC) conducted a study to 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).

4 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.

66
 Figure 2: All American Canal Sulfate (SO4) Data



New Data 10/2005
 Fabrica Provided

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 REQUEST TO DELIST PALO VERDE OUTFALL DRAIN FOR BACTERIA INDICATORS

53/66 exceeded 250mg/L
 0/66 exceeded 500 + 600 mg/L
 13 below criteria

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.

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 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

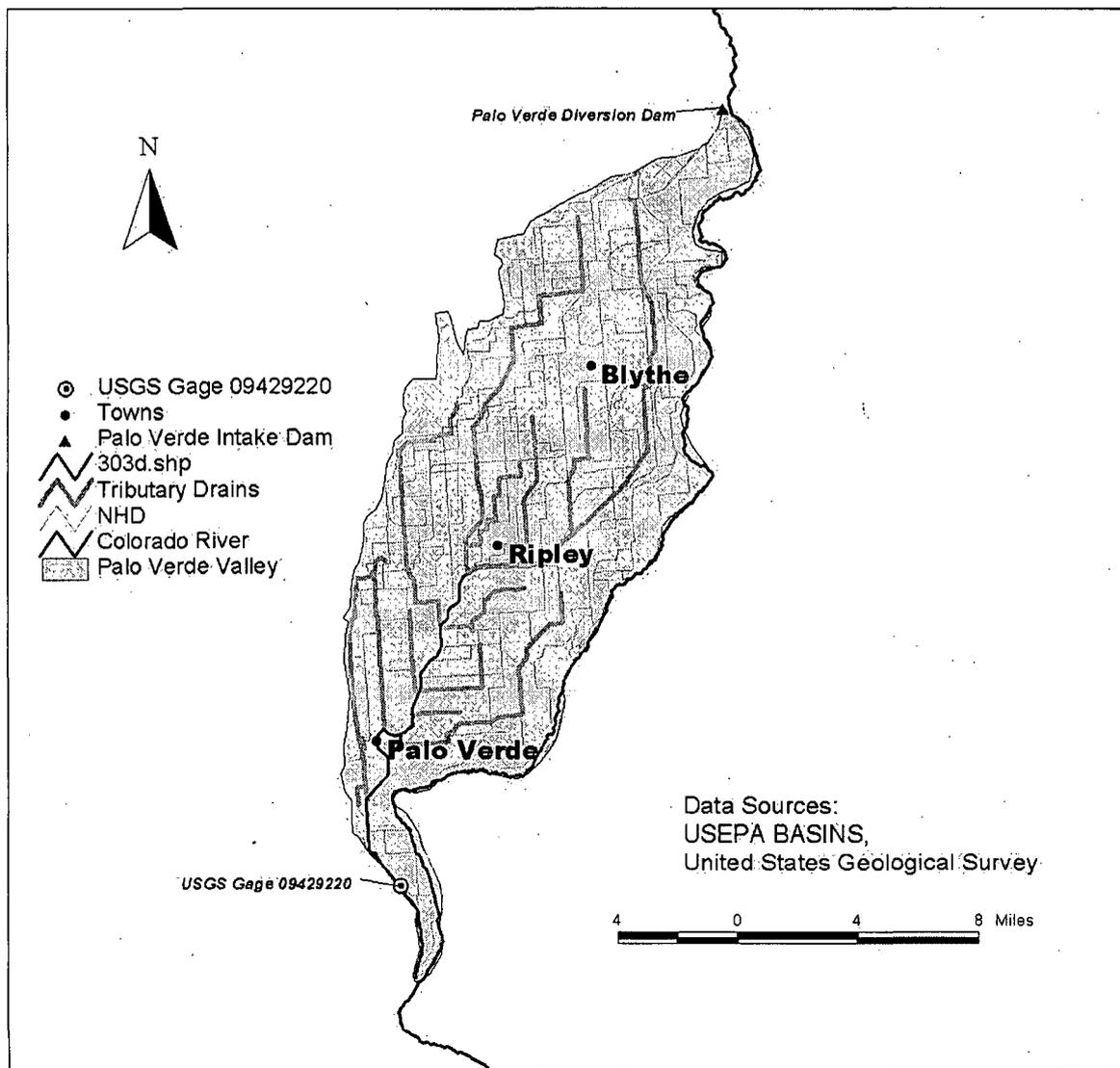


Figure 4: Palo Verde Outfall Drain Area

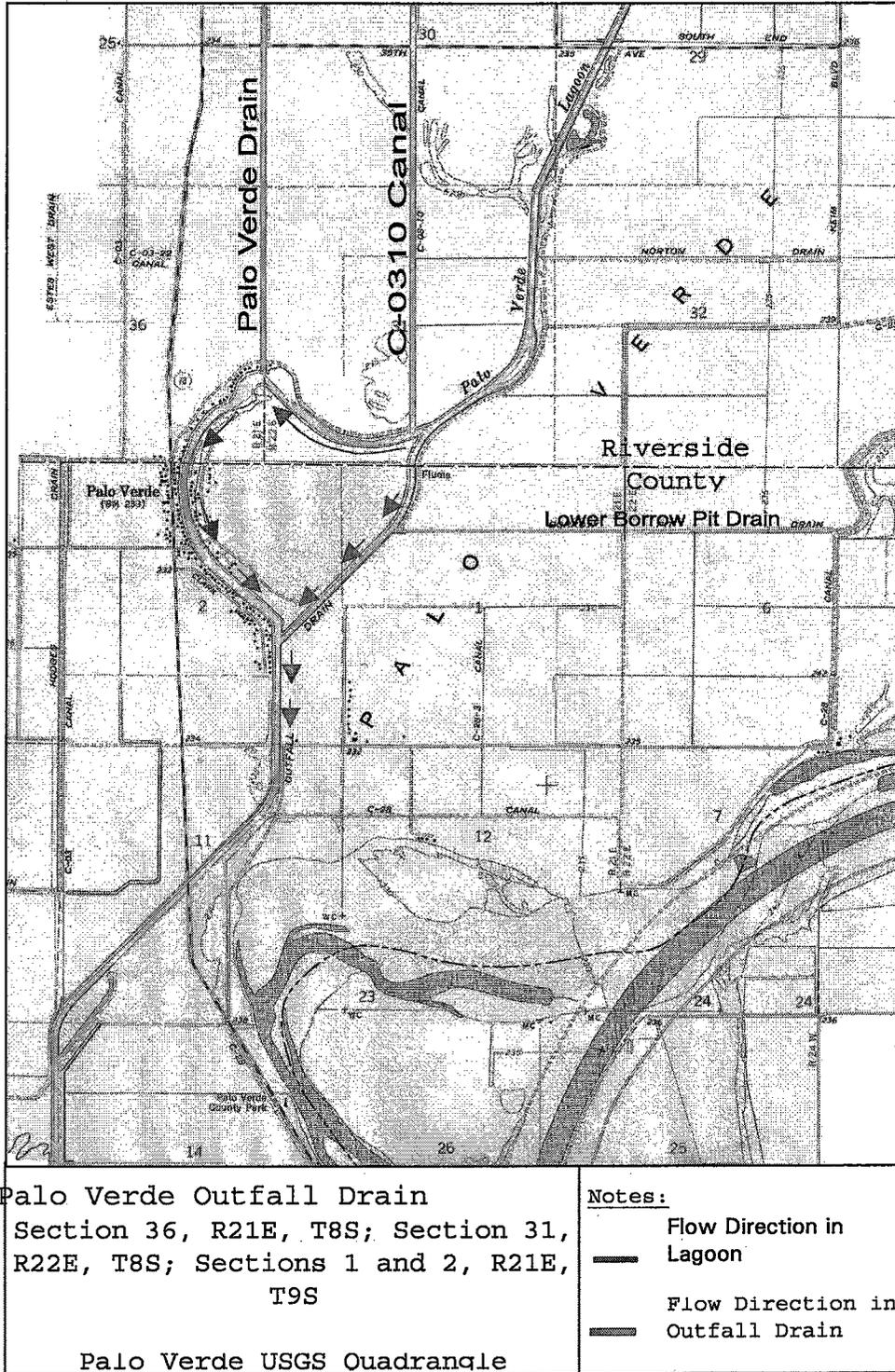
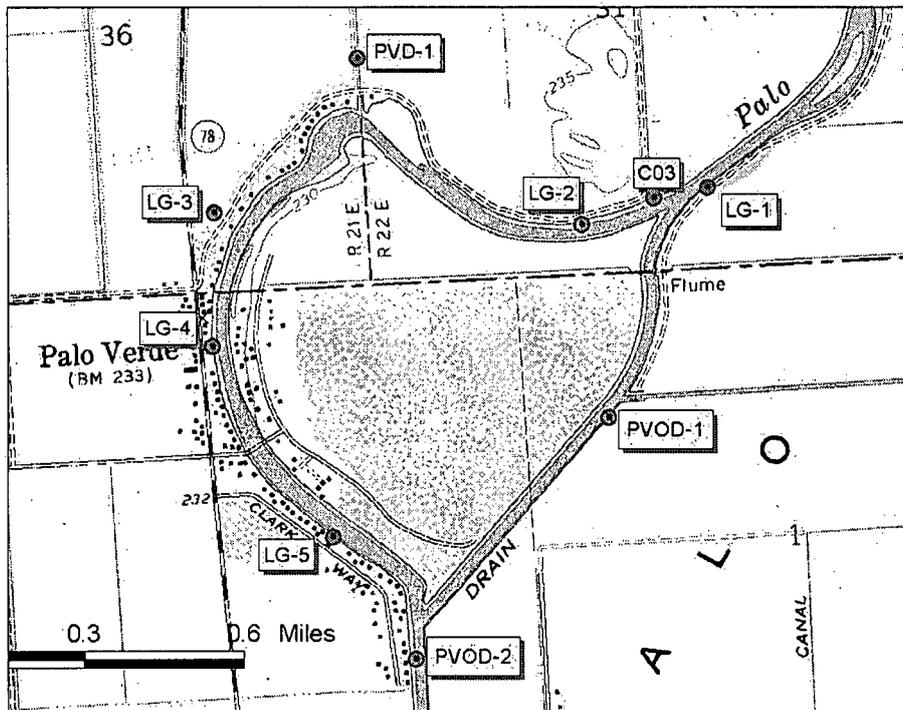


Table 2: Monitoring Stations and Number of Observations

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.

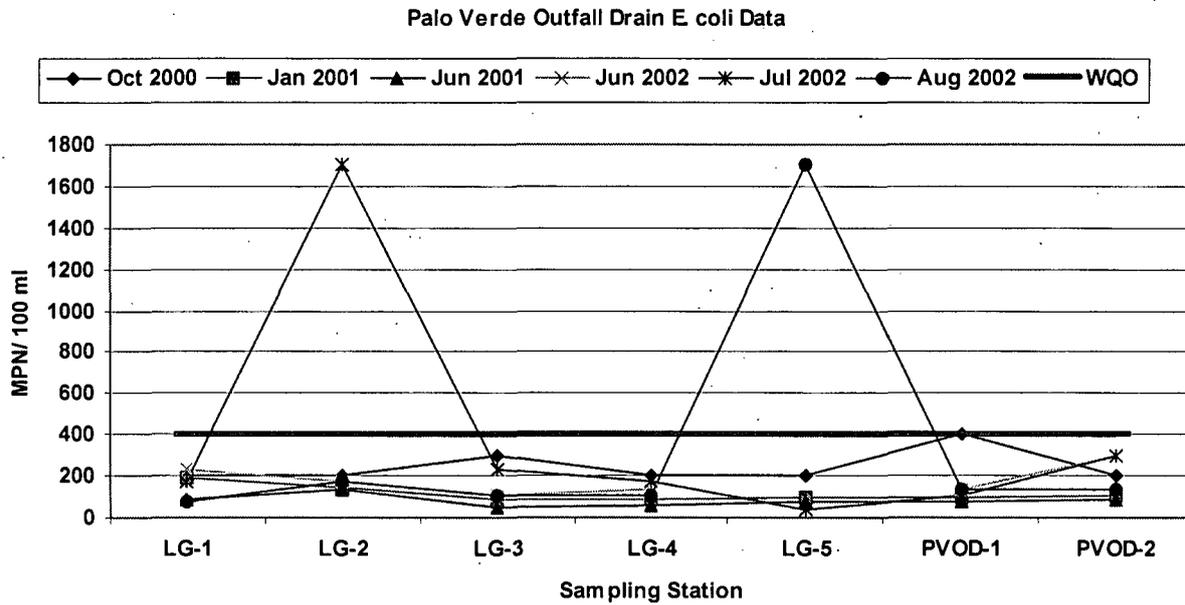
For a sample size ranging from 37 to 42, Table 4.2 of the listing policy requires delisting if the number of exceedances is equal to or less than six. Palo Verde has only two exceedances, and therefore should be delisted for bacterial indicator impairment.

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

Localized in
93 For
pathogens

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)

From
Nadim
zeywar - R7

Colorado River
Res. main Drain 4

(1) Date	<input type="text"/>	(2) Time:	<input type="text"/>
(3) Station Name	Reservation Main Drain 4	(4) GPS Waypoint ID:	RMD4
Geographic Coordinates:		(5) PName Code	<input type="text"/>
(6) Zone (UTM)	11	(7) HUC	727
(8) UTM E or Long.	W 114°37.321'	(9) 7.5" TOPO Map	Yuma East
(10) UTM N or Lat.	N 32°37.321'	(11) Stream Gage Number	<input type="text"/>
(12) Datum	WGS84	(13) Stream Gage Agency	USGS
(14) DOP	<input type="text"/>	EPE	<input type="text"/>
(15) Gage Contact:	J. Shannon Tunnell, Hydrologic Technician 1940 S. 3rd Ave., Yuma AZ 85364 Phone #928 782-6024 jtunnell@usgs.gov		
(16) GPS Unit	Garmin 12 Map		

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671

Physical Location and Access	
(17) County:	Imperial
(18) Station Elevation:	<input type="text"/>
(19) Access Road:	S-24, open-access dirt road alongside drain
(20) Nearest Mile Post:	<input type="text"/>
(21) Surveyed by:	Logan Raub ES and Jeff Allred WRCE
Access Notes:	(22) Site access permission--contact name and phone:
(23) Gates--keys required (see #22)?NO	(24) Traffic flow/parking: Little traffic, park beside the gauging station
(26) Site access by boat only? If yes, see page 2.NO	(25) Text description of how to reach site: Take Interstate 8 East to Winterhaven, California. Exit the Interstate onto 4th street, make a left. Travel 1/4 mile and exit to the right onto S-24. Pass under the Railroad tracks. Immediately passing under the railroad tracks, S-24 crosses over the Main Drain. The sampling site is located about 100 feet to the West(left) of S-24 on a dirt road. The USGS has a monitoring station at the sampling site.

Site Characteristics	
(27) Channel Type	Irrigation Drainage Canal
(28) Approximate depth	2-3.5 feet
(29) Seasonal considerations, site description, known hazards:	<input type="text"/>
(30) Map and photo information: List if any known photos and maps of site, and if digital, list filename and location.	We visited the site on 02-01-01, and took 3 photographs of the sampling station. The photograph names are 1675.JPG, 1676.JPG, and 1677.JPG. A map of the area is available from the Automobile Club of California (AAA), for the Imperial County.

Nearest Emergency Facilities:	
(31) CHP	1 Killingsworth Drive, Felicity 92283 (In Winterhaven) Phone:760-572-0294
(32) Fire/Rescue	The City of Yuma has 5 stations and Imperial County can also respond Phone:911

Send To Printer

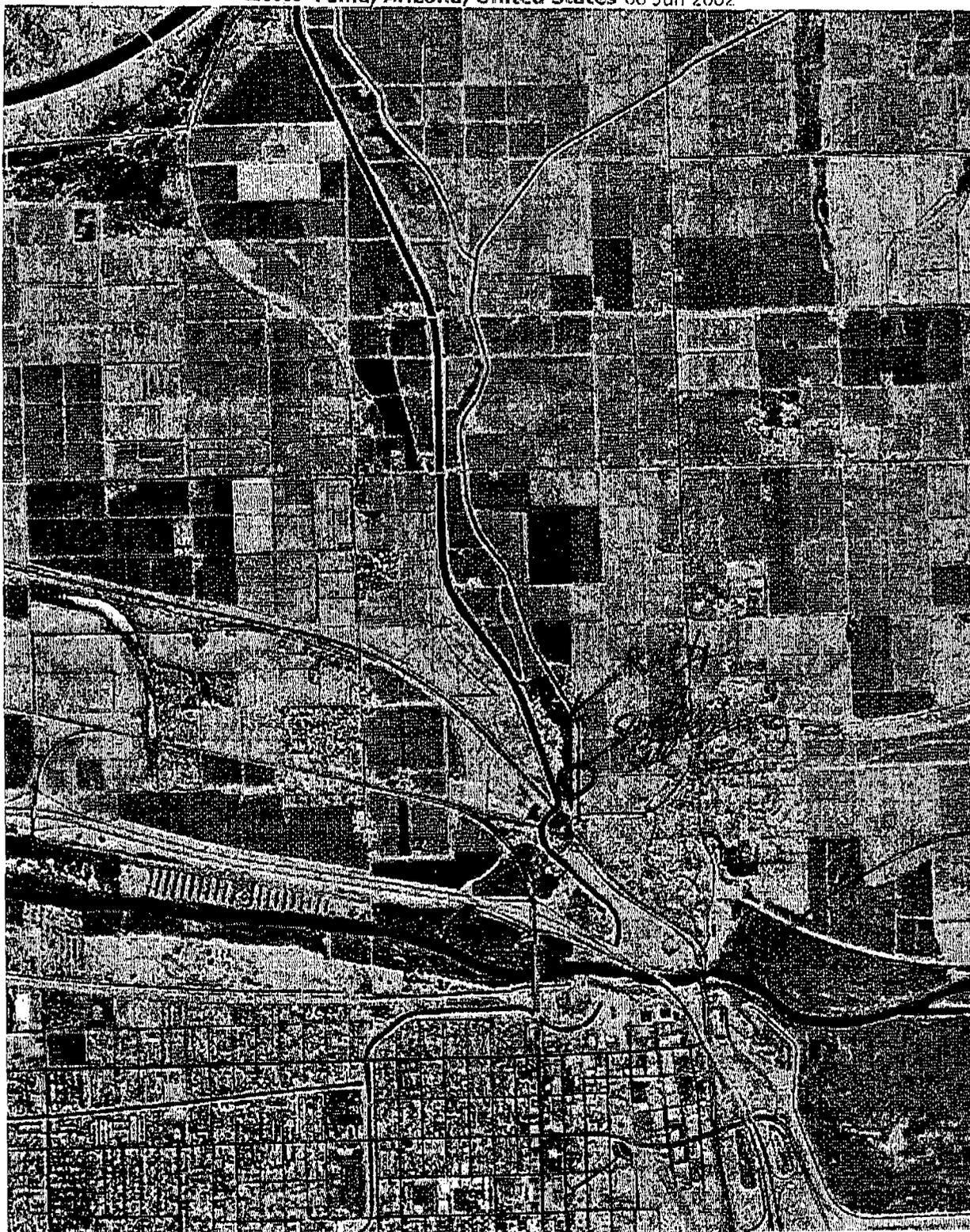
Back To TerraServer

Change to 11x17 Print Size

Show Grid Lines

Change to Landscape

USGS Yuma, Arizona, United States 08 Jun 2002



RMD4
is part
of the
Bard
Valley
Drains

Colorado
R.
Colorado
River

0 1Km

0 1.5Mi

Image courtesy of the U.S. Geological Survey

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REC I II,
WA, WLD

Water Resources

Data Category:

Site Information

Geographic Area:

United States

go

Site Map for the Nation

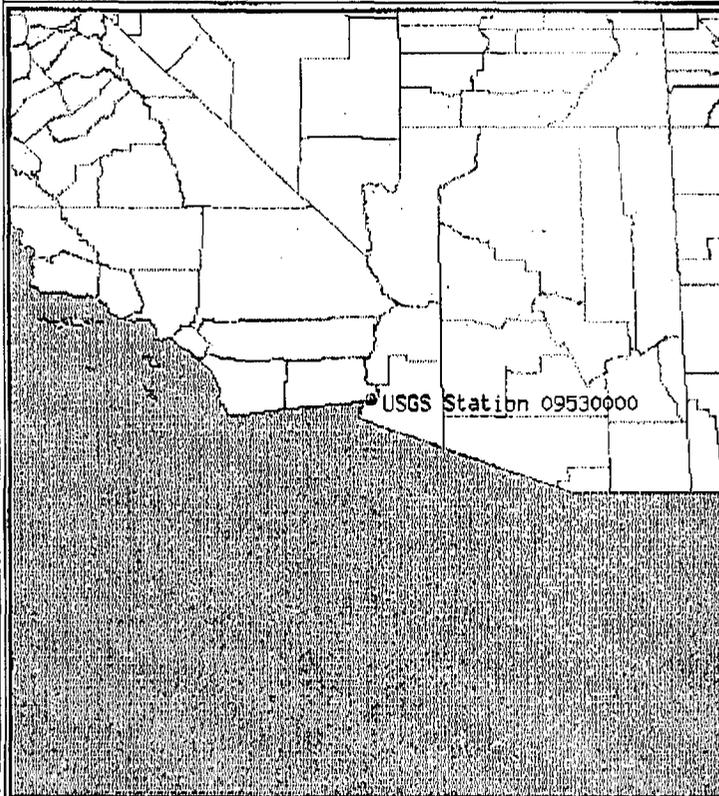
USGS 09530000 RESERVATION MAIN DRAIN NO. 4 NR YUMA, AZ

Available data for this site

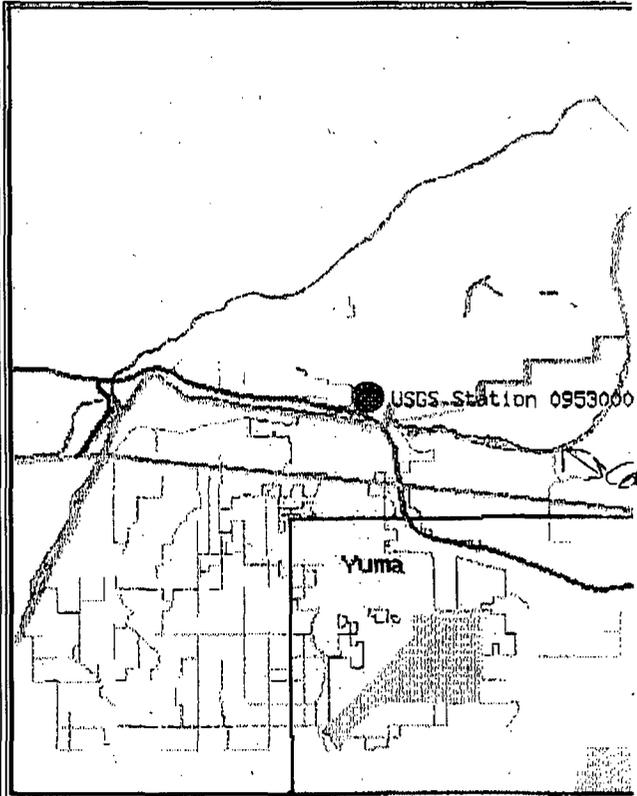


Imperial County, California
 Hydrologic Unit Code 15030107
 Latitude 32°44'14", Longitude 114°37'16" NAD27
 Gage datum 127. feet above sea level NGVD29

Location of the site in USA.



Site map.



ZOOM IN 2X, 4X, 6X, 8X, or ZOOM OUT 2X, 6X, 8X.

Maps are generated by US Census Bureau TIGER Mapping Service.

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 NWIS Site Inventory for USA: Site Map
<http://waterdata.usgs.gov/nwis/nwismap?>

[Top](#)
[Explanation of terms](#)

Nadim Zeywar - Fwd: Colorado Main Drain 4

Page 1

From: Joan Stormo
To: Nadim Zeywar
Date: 10/12/05 10:10AM
Subject: Fwd: Colorado Main Drain 4

*Reservation
main Drain
4*

>>> Mariella Carpio-Obeso 10/12/05 10:03 AM >>>
Joan

Per your request, the location of the Reservation Main Drain 4 is in the LAN at the SWAMP folder. Following the reconnaissance conducted by Jeff Allred and Logan Raub. Take Interstate 8 East to Winterhaven, California. Exit the Interstate onto 4th street, make a left. Travel 1/4 mile and exit to the right onto S-24. Pass under the Railroad tracks. Immediately passing under the railroad tracks, S-24 crosses over the Main Drain. The sampling site is located about 100 feet to the West (left) of S-24 on a dirt road. The USGS has a monitoring station at the sampling site. You may found some photos from the site. The photograph names are 1675.JPG, 1676.JPG, and 1677.JPG.

I hope this could be useful, so far this could be the last site in the California side

Mariela

Please take note of new e-mail address

Maria de la Paz Carpio-Obeso, Ph.D.
Environmental Scientist
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Warning Drive, Suite 100
Palm Desert, CA 92260
Phone (760) 674-0803
Fax (760) 341-6820
E-mail: mcarpio-obeso@waterboards.ca.gov

Yahoo! My Yahoo! Mail Make Yahoo! your home page

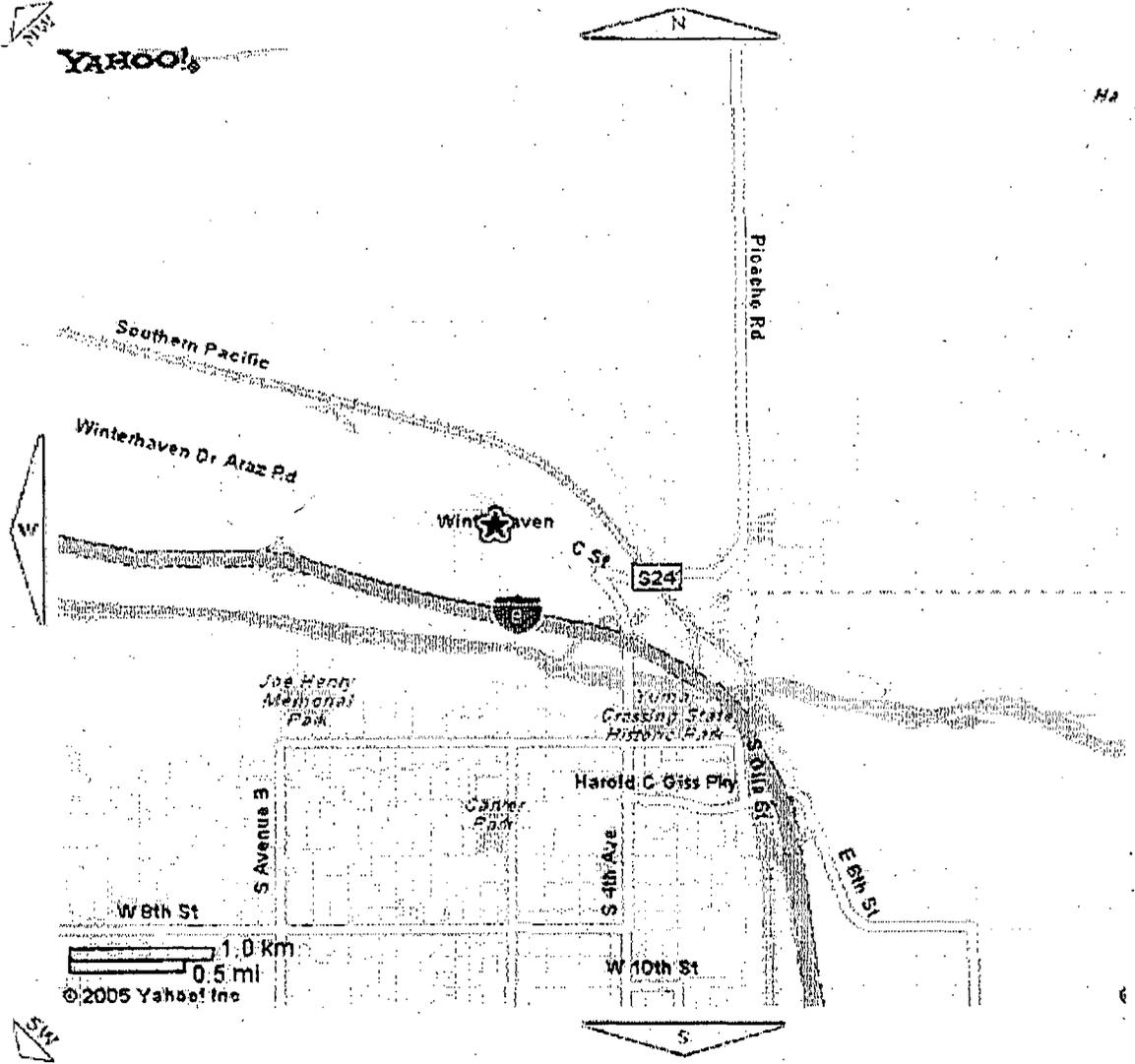
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Maps New User? Sign Up



★ Map for: Winterhaven, CA Save

Driving Directions: [To Here](#) - [From Here](#) [Printable Version](#) [Email Map](#) [Link to this Map](#)

1st.3city567state910
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 small map



See these business locations on this map

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The National Map Yuma, Arizona, United States 7/1/1979

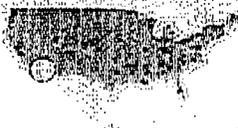
Street

City

Winterhaven

State

California



Longitude

Latitude

-114.60925

32.74179



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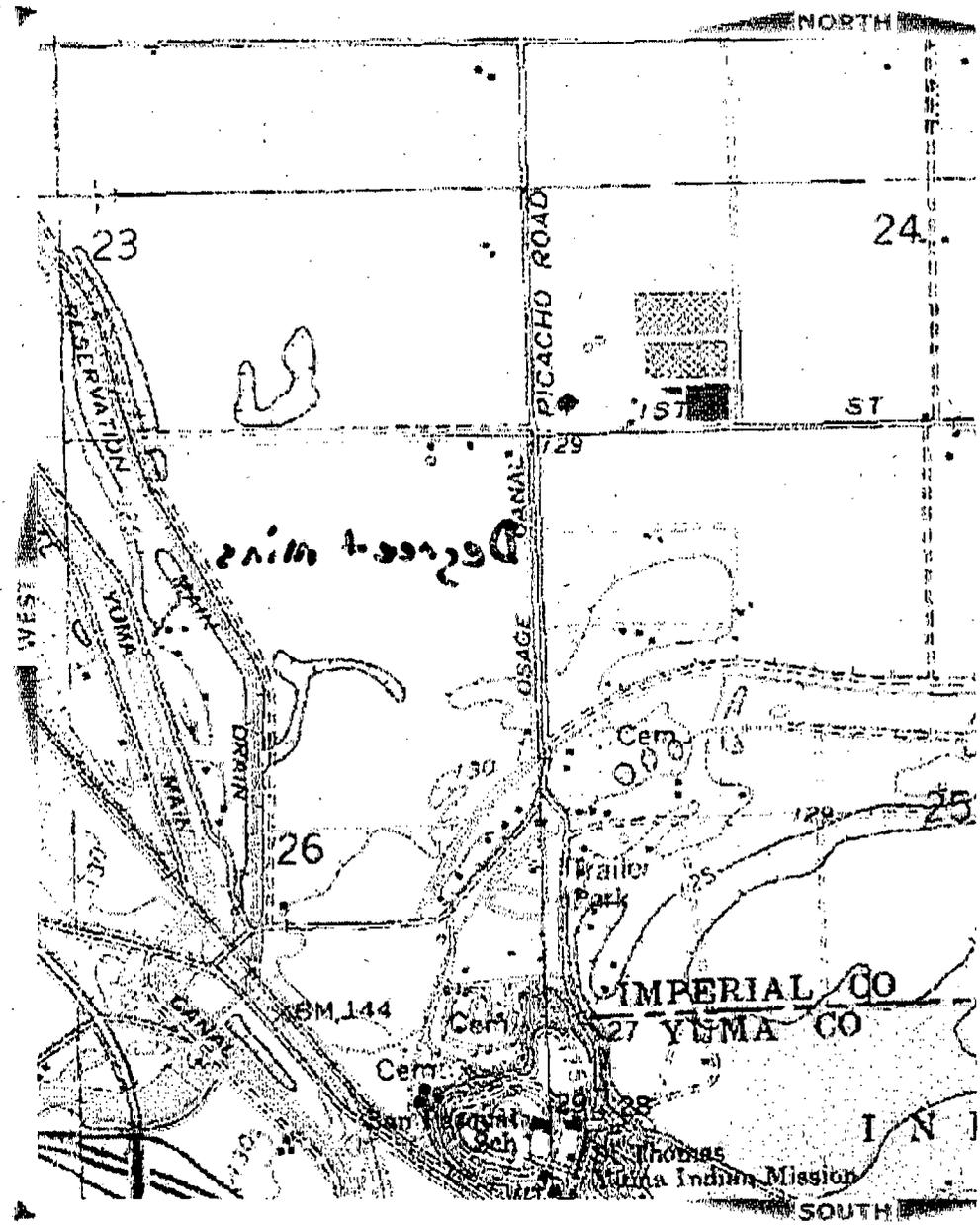


Image courtesy of the U.S. Geological Survey

House and Home Demographics:

- Schools, Crime and Demographics for 85356
- Schools, Crime and Demographics for 85365

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Degree + mins

long 37.321/60 and add to 114.00

Lat