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TECHNICAL MEMORANDUM

Date: **Final December 2007; Revised Draft November 23, 2005; Original Draft, June 6, 2005**

To: **Laura Hidas, Project Coordinator, ACWD**

From: **Lucy Buchan, EOA Inc.**

Subject: **Technical Memorandum: Task 4 Baseline Water Quality Profile, SBA System Watershed Management Program Development Project**

cc: **Dan Sicular, ESA**

Background

The purpose of Task 4 is to develop a baseline water quality profile of the South Bay Aqueduct (SBA) System. This profile will provide a basis for comparing water quality data collected after the Watershed Management Plan has been implemented. The baseline water quality profile includes wet and dry season data for one drought year, one average year, and one wet year from each water treatment facility influent on the SBA and the Department of Water Resources (DWR) sampling stations located on the SBA (Figure 1). These sites were chosen because they represent geographically diverse sources of water quality monitoring data that are available for the SBA System and may reflect a range of exposure to contaminants potentially impacting this System.

Characterization of Water Quality Data Sample Stations

Over the course of the year, the water supplied by the SBA may be 100% water from the Delta, a blend of Delta and Lake Del Valle water, or 100% Lake Del Valle water. Blending, if any, occurs downstream of Del Valle Check 7; therefore, the various sample stations may receive different blends of water at different times of the year. Water received at the sample stations can be characterized as follows:

- Banks Pumping Plant & Autostation KA000331 (DWR) – always receives 100% Delta water.
- Patterson Pass Water Treatment Plant (Zone 7 Water Agency) - always receives 100% Delta water, plus possible local runoff from Bethany Reservoir and open SBA canal sections. Prior to being sampled, the water passes through Patterson Reservoir.
- Del Valle Check 7 Autostation KB001638 (DWR) - always receives 100% Delta water, plus possible local runoff from Bethany Reservoir and open SBA canal sections.

- Del Valle Water Treatment Plant (Zone 7 Water Agency) – can receive any blend of Delta and Lake Del Valle water (0 to 100% either source), plus possible local runoff from Bethany Reservoir and open SBA canal sections.
- Vallecitos Autostation KB002240 (DWR) – receives the same water as Del Valle Water Treatment Plant through a closed pipeline.
- Mission San Jose Water Treatment Plant and Water Treatment Plant 2 (Alameda County Water District) – receives the same water as Del Valle Water Treatment Plant through a closed pipeline. Turnouts from the SBA for the two facilities are adjacent, so raw water quality data from either plant can be used interchangeably to represent the SBA source.
- Santa Clara Terminal Tank KB004207 (DWR) – receives the same water as Del Valle Water Treatment Plant through a closed pipeline but terminates in an open-topped tank.
- Penitencia Water Treatment Plant (Santa Clara Valley Water District) – receives the same water as Del Valle Water Treatment Plant that passes through a closed pipeline and the open-topped Terminal Tank.

Selection of Water Years

Discussions with staff representing the Alameda County Water District (ACWD), Zone 7 Water Agency (Zone 7), and the Santa Clara Valley Water District (SCVWD), collectively referred to as SBA Contractors, resulted in the selection of 1990 – 1991 to represent a drought year, 1997 – 1998 to represent a wet year, and 2001 – 2002 to represent an average year. Each water year is defined as October 1st of the first year listed to September 30th of the second year listed. These selections were based on rainfall data, and in the case of the average year, on the basis of receiving 70%[1] of the State Water Project allocation. The preferred water year to represent drought was 1976 – 1977 because it was the driest single year of California's measured hydrologic record (http://watersupplyconditions.water.ca.gov/background.cfm). However, limitations of data completeness and accessibility for this year resulted in selection of 1990 – 1991, which falls within California's most recent multi-year drought, 1987-92.

[1] The criterion originally proposed was 73% allocation (the average SWP allocation over the last 15 years), however, it was not met within recent decades in which monitoring data were available.

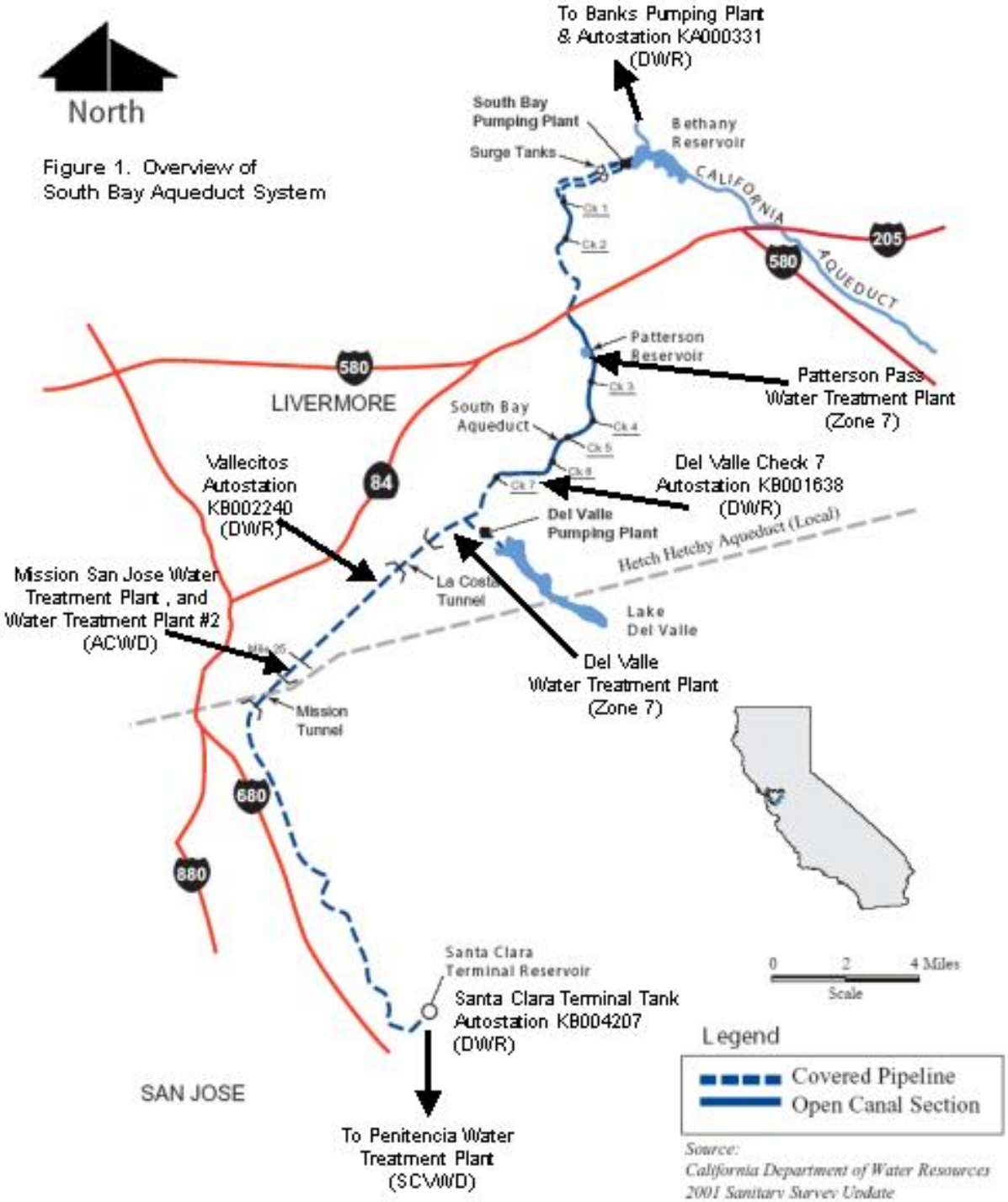


Figure 1. Overview of South Bay Aqueduct System

Characterization of Dry and Wet Seasons

The dry and wet seasons (Table 1) were defined for each of the representative water years based on examination of rainfall data for two precipitation gauges along the SBA (Table 2, Figure 2): Patterson Pass Water Treatment Plant gauge; and Alameda County Public Works Department's Sunol gauge #4.

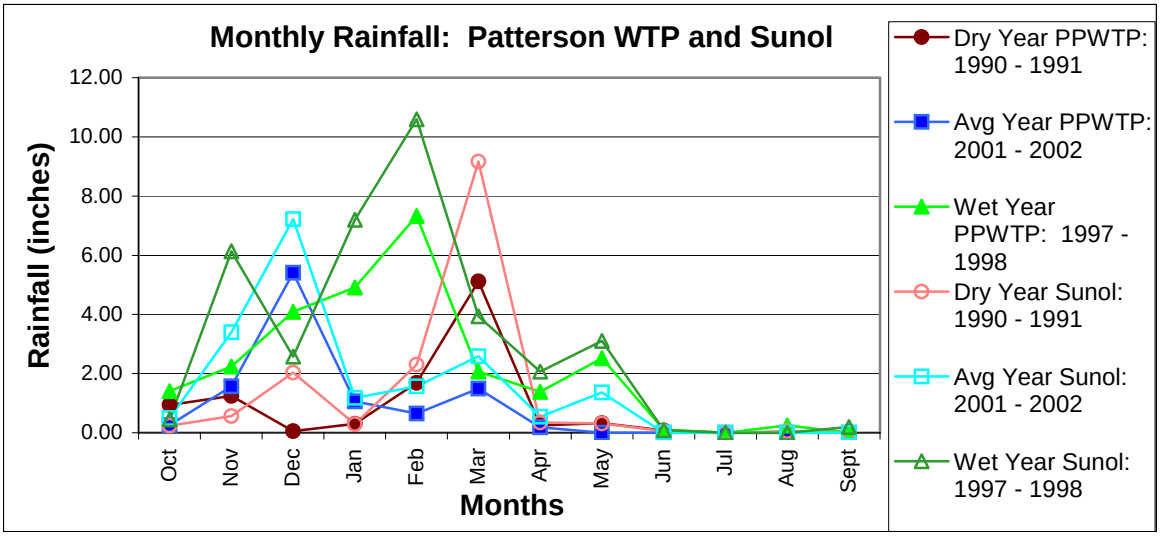
Table 1. Characterization of Dry and Wet Seasons for Representative Water Years

	Dry Year (1990 – 1991)	Average Year (2001 – 2002)	Wet Year (1997 – 1998)
Dry Season	April - October	April - October	June - September
Wet Season	November - March	November - March	October - May

Table 2. Monthly rainfall data for two precipitation gauges near the South Bay Aqueduct: Patterson Pass Water Treatment Plant (PPWTP) Gauge; Sunol Gauge #4, operated by the Alameda County Public Works Department. Unshaded cells indicate dry season; shaded cells indicate wet season.

	Dry Year: 1990 – 1991													
	1990		1991										Total	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Dry	Wet
PPWTP	0.94	1.24	0.05	0.3	1.69	5.12	0.25	0.32	0.08	0	0	0.03	1.62	8.4
Sunol	0.24	0.56	2.03	0.29	2.3	9.17	0.35	0.31	0.05	0	0.05	0	1.00	14.35
	Average Yr: 2001 – 2002													
	2001		2002											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Dry	Wet
PPWTP	0.26	1.57	5.41	1.06	0.65	1.49	0.18	0	0	0	0	0	0.44	10.18
Sunol	0.5	3.4	7.22	1.18	1.57	2.59	0.54	1.36	0	0	0	0	2.40	15.96
	Wet Year: 1997 – 1998													
	1997		1998											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Dry	Wet
PPWTP	1.41	2.24	4.09	4.91	7.33	2.07	1.39	2.52	0.11	0	0.25	0	5.68	20.64
Sunol	0.45	6.14	2.57	7.2	10.59	3.94	2.07	3.11	0.09	0	0	0.2	5.92	30.44

Figure 2. Monthly rainfall data for precipitation gauges near the South Bay Aqueduct: Patterson Pass Water Treatment Plant (PPWTP) Gauge; Sunol Gauge #4, operated by the Alameda County Public Works Department.



Water Quality Indicator Data Compilation

The following indicators were chosen for inclusion in the baseline water quality profile based on previous reports that identified watershed contaminants that may threaten drinking water quality (Archibald and Wallberg 2002, 2005, California Department of Water Resources 2001):

- microbial indicators (E. coli, total coliform, and fecal coliform);
- pathogens (Giardia and Cryptosporidium);
- bromide;
- total organic carbon;
- turbidity;
- total dissolved solids;
- specific conductance; and
- nutrients (nitrate, nitrite, phosphorus/phosphate).

Table 3. Potential Contaminants of Concern in the South Bay Aqueduct System.

Contaminant of Concern	Rationale
Microbes • E. coli • Total coliform • Fecal coliform	Microbes may indicate fecal contamination of water sources via stormwater runoff, agricultural grazing, wild animal populations, human recreation, and spills or overflows of raw sewage from septic leaching fields and/or wastewater treatment facilities.
Pathogens: • Giardia • Cryptosporidium	Pathogens may indicate fecal contamination of water sources via stormwater runoff, agricultural grazing, wild animal populations, human recreation, and spills or overflows of raw sewage from septic leaching fields and/or wastewater treatment facilities.
Bromide	Bromide likely reflects seawater contributions from Delta water at the Banks pumping station and is of interest because in source water it can react with disinfectants used in the treatment process to produce disinfectant byproducts (DBPs) such as trihalomethanes, haloacetic acids, and bromate.
Total Organic Carbon	Total organic carbon may derive from stormwater runoff and septic leaching and/or wastewater treatment facilities and is similarly of interest due to its proclivity to react with disinfectants and produce DBPs.
Total Dissolved Solids	Total dissolved solids can include sediment and other solids such as algae. Sediment may be introduced into the SBA from multiple sources including stormwater runoff, agricultural grazing, wild animal populations, human recreation, and wastewater treatment facilities. Algal blooms may be encouraged by nutrient enrichment – see below.
Nutrients: • Nitrate • Nitrite • Phosphorus	Nutrients including nitrate, nitrite, and phosphorus contribute to algal blooms, including 2-methylisoborneol (MIB) and geosmin, which are responsible for considerable taste and odor problems in SBA water and have caused operational problems at pumping plants by clogging filters. Nutrients may be introduced by sewage spills, leaks, or leaching, by stormwater flows, agricultural activities, or by wild animal populations.

Sulfate and chloride are also included in the baseline as parameters of interest for water quality due to their relationship to seawater intrusion. Alkalinity, hardness, specific conductance, temperature, and pH are also included to facilitate interpretation of potential watershed contaminants.

Methods of Statistical Summary for Compiled Water Quality Parameters

Data were requested from each SBA contractor and the DWR for the above indicators for the three water-years selected to represent drought, average, and wet conditions. For each water year and season, water quality parameters were summarized using the following summary statistics: mean, median, minimum value, maximum value, percentile ranges (10th and 90th), and the number of samples. For total coliform, the geometric mean was calculated rather than the arithmetic mean to provide a statistic comparable to the Water Quality Objective (WQO) in the Basin Plan (see below). The frequency of samples used in the analysis varies depending on the sampling programs used in the past by the SBA contractors and the DWR. The above statistics were calculated for all indicators with a sample size > 1, with the recognition that statistics derived from small numbers of sampling events are less robust.

Summary statistics for potential water quality contaminants were analyzed both in terms of spatial and temporal trends, e.g., differences among sampling stations upstream and downstream; differences among seasons and water years, and in comparison to water quality standards, including Water Quality Objectives [WQO] for Municipal Supply (RWQCB 1995), Maximum Contaminant Levels [MCL] and Secondary Maximum Contaminant Levels [SMCL] (California State Department of Health Services 2005) and CALFED Agency targets [CF] (CALFED 2000). Water quality standards are available for a subset of 11 parameters included in this report (turbidity, pH, total dissolved solids, specific conductance, nitrate, nitrite, sulfate, total coliform, fecal coliform, bromide, and total organic carbon). Although no absolute numerical standard exists for *Cryptosporidium* or *Giardia*, for the purposes of this project, any detection of an oocyst or cyst is considered to exceed the desired level for those parameters; the upcoming Long Term 2 Surface Water Treatment Rule [LT2], expected to be promulgated by the Environmental Protection Agency in late 2005, will include additional treatment requirements for any system that detects *Cryptosporidium* in source waters at levels greater than 0.075 oocyst/L. Thus, including pathogens, a total of 13 parameters were compared to the various water quality standards in Table 4. The source of each water quality standard used for comparison is listed in the table as well. Please note that these comparisons to standards are being made for informational purposes only; seasonal mean values exceeding a water quality standard are not considered to be violations of that standard (Table 4).

Results of Statistical Summaries

Table 4 identifies which indicators exceeded existing water quality standards for municipal supply by comparing the seasonal mean[2] calculated for each sampling station in the three representative water years, to the applicable water quality standard. Table 4 summarizes the information presented in Appendix A, Tables A-1 through A-21: statistical summaries of the water quality indicators listed above by water-year, wet and dry season for each sampling site included in this study. The following section summarizes the trends observed in Table 3. **Due to the great difference in sample sizes for these parameters, some percentages are more representative than others (see tables A-1 through A-21 for sample size).**

The data in Tables A-1 through A-21 are presented in the same order to facilitate comparisons between tables. In a few cases, SBA contractors measured indicators using slightly different parameters, e.g., N vs NH_3; P vs PO_4. To keep table sizes small enough to reasonably fit on the page, these data were included in the same location within the table, and the column headers and legends were modified to reflect the respective measurement. In the average and wet years, the SCVWD was the only agency that collected data for fecal coliforms and enterococci. These data were included as additional columns at the end of the

[2] Arithmetic mean except for Total Coliform, for which geometric mean is used.

respective tables. Parameters listed in tables as "<" or ">" indicate detection limits reached during laboratory analysis.

Summary of General Temporal and Spatial Trends

Temporal Trends:

- Indicator values were generally higher in the wet season than in the dry season for each of the three water years.
- Temporal patterns across the selected water-years were apparent for some indicators. For example, during the dry season, specific conductance was more similar between the dry and average years than during the wet year. However, during the wet season, specific conductance during the dry year was greater than the other years. Total organic carbon, during the dry season, was greater in the drought year than during the other years.

Spatial Trends:

- Indicator values did not exhibit clear spatial trends; they did not consistently decrease or increase from upstream to downstream sampling sites. The lack of spatial trends may be due to the variation in sample dates and sample sizes of the different data sets.

Summary of Comparisons to Water Quality Standards

Indicators Not Exceeding Water Quality Standards:

- The seasonal mean values for six of the 13 parameters for which water quality standards were defined, did not exceed these water quality standards at any of the eight sampling sites during the three water years analyzed: total dissolved solids, pH, specific conductance, nitrite, nitrate, and sulfate.

- Seasonal mean values for *Giardia* and *Cryptosporidium* did not exceed the respective water quality standards, however, one sampling event at the ACWD WTP during the wet season of the wet year detected a positive level for both indicators.

Indicators Most Frequently Exceeding Water Quality Standards:

- The indicator with the greatest number of mean seasonal exceedences, across all three water-years, was bromide (96%), followed by turbidity (77%), total organic carbon (74%), and total coliform (52%).

Temporal Trends in Exceedences of Water Quality Standards:

- The percentage of mean seasonal exceedences differed among all three water years, however, the percentage of mean seasonal exceedences was more similar between the average and wet year in comparison to the drought year.

- The percentage of mean seasonal exceedences was greater during the wet season than the dry season for all parameters except turbidity.

Spatial Trends in Exceedences of Water Quality Standards:

- The data did not indicate a consistent linear spatial trend (e.g., either consistently increasing or decreasing in an upstream or downstream order). Again, this may be due to variations in sample sizes and dates of the different data sets being compared. Comparing across all indicators, those from Banks Pumping Plant and the ACWD WTPs most consistently exceeded WQ standards. Across both water-year and season, most parameters either stayed relatively constant or decreased slightly between Banks and the PPWTP, but increased at DV Chk7 and continued to increase and decrease in an irregular pattern.

Table 4. Mean values by season and water year for water quality indicators. Bold values indicate seasonal means that exceed the associated water quality standard. A "- - " indicates no data available.

Water Year	Season	Sample Site	Turb	TDS	pH	Spec EC	Br	TOC	N02	N03	S04	Tot Colif	Fec Colif	Crypt	Giard
		Units	NTU	mg/L	--	umhos/cm	mg/L	mg/L	mg/L as N	mg/L as NO_3	mg/L	MPN/100mL	MPN/100mL	#Oocysts/L	#Oocysts/L
Water Quality Standard			***5.0***	***500***	***6.5***	***900***	***0.05***	***3.0***	***1***	***45***	***250***	***100***	***20***	***0.075***	***0.075***
Standard Source			WQO/SMCL	WQO/SMCL	WQO	WQO/SMCL	CF	CF	WQO/MCL	WQO/MCL	WQO/MCL	WQO	WQO	LT2	LT2
Drought	Dry	Banks	**13.7**	282	7.4	509	**0.27**	**4.6**	-	-	31	-	-	-	-
		PPWTP	**6.7**	271	7.8	500	-	-	-	2.33	32	65	-	-	-
		DV Chk7	-	-	-	-	-	-	-	-	-	-	-	-	-
		DVWTP	4.7	274	7.9	489	-	-	-	1.09	25	65	-	-	-
		Vallecitos	-	-	-	-	-	-	-	-	-	-	-	-	-
		ACWD	-	-	-	-	-	-	-	-	-	-	-	-	-
		SC TT	-	252	7.6	459	**0.23**	-	-	2.35	32	-	-	-	-
		SC PEN	**10.5**	286	7.9	502	**0.32**	**4.6**	-	2.24	35	-	-	-	-
	Wet	Banks	**9.0**	415	7.4	845	**0.47**	**4.6**	-	-	50	-	-	-	-
		PPWTP	4.0	395	7.9	730	-	-	-	9.31	45	8	-	-	-
		DV Chk7	-	-	-	-	-	-	-	-	-	-	-	-	-
		DVWTP	3.5	394	7.7	710	-	-	-	6.08	44	8	-	-	-
		Vallecitos	-	-	-	-	-	-	-	-	-	-	-	-	-
		ACWD	-	385	-	-	-	-	-	3.00	-	-	-	-	-
		SC TT	-	411	7.2	762	-	-	-	-	51	-	-	-	-
		SC PEN	**8.4**	438	8.0	768	**0.47**	**4.6**	0.0008	3.23	52	**149**	-	-	-
Average	Dry	Banks	**13.0**	261	8.1	448	**0.19**	**3.5**	0.17	1.49	24	31	-	-	-
		PPWTP	4.5	261	7.8	445	**0.22**	2.5	-	1.73	30	**568**	-		
		DV Chk7	**12.6**	267	7.3	454	**0.19**	**3.8**	0.15	1.41	24	-	-	-	-
		DVWTP	**9.8**	269	7.9	473	**0.22**	2.6	-	1.03	32	**473**	6.5	<0.3	<0.3
		Vallecitos	**13.0**	-	7.9	474	-	-	-	-	-	-	-	-	-
		ACWD	**10.5**	262	8.0	425	**0.21**	**3.1**	-	-	35	**1721**	-	-	-
		SC TT	**14.0**	301	-	492	**0.26**	-	-	1.85	32	-	-	-	-
		SC PEN	**9.2**	247	8.0	455	**0.22**	**3.6**	-	2.64	30	36	8	-	-
	Wet	Banks	**12.9**	256	8.2	437	**0.19**	**5.1**	0.29	4.20	37	**222**	-	-	-
		PPWTP	3.4	307	8.0	526	**0.28**	2.9	-	2.39	32	**156**	-	<0.1	<0.1
		DV Chk7	**10.1**	-	-	408	-	-	-	-	-	-	-	-	-
		DVWTP	2.3	244	8.0	401	**0.12**	**3.7**	-	1.02	36	43	1.9	<0.3	<0.3
		Vallecitos	**9.5**	-	7.5	456	-	-	-	-	-	-	-	-	-
		ACWD	2.7	252	8.0	420	**0.12**	**3.7**				62	-	-	-
		SC TT	-	-	-	-	-	-	-	-	-	-	-	-	-
		SC PEN	-	-	-	-	-	-	-	-	-	23	9	-	-
Wet	Dry	Banks	**20.3**	115	7.8	226	0.05	-	-	-	20	10	-	-	-
		PPWTP	**5.5**	129	7.7	207	**0.07**	2.5	-	1.47	18	**110**	-	-	-
		DV Chk7	**16.1**	118	7.3	233	-	-	-	2.03	-	-	-	-	-
		DVWTP	**9.0**	156	7.7	267	**0.07**	2.9	-	1.39	23	**270**	-	-	-
		Vallecitos	-	-	-	-	-	-	-	-	-	-	-	-	-
		ACWD	**12.9**	-	7.8	206	**0.06**	**3.0**	-	0.61	32	**423**	-	-	-
		SC TT	-	-	-	-	-	-	-	-	-	-	-	-	-
		SC PEN	**11.4**	169	7.9	227	**0.06**	2.6		1.76	24	**106**	7	<6.7	<6.7
	Wet	Banks	**7.4**	291	7.2	527	**0.27**	**4.2**	-	-	45	**109**	-	-	-
		PPWTP	4.3	291	8.0	526	**0.46**	**3.8**	-	3.81	43	64	-	-	-
		DV Chk7	**7.4**	283	8.0	398	-	-	-	2.90	-	-	-	-	-
		DVWTP	**15.3**	233	7.7	422	**0.42**	**3.6**	-	1.93	33	**186**	-	-	-
		Vallecitos	-	-	-	-	-	-	-	-	-	-	-	-	-
		ACWD	**15.5**	224	7.7	374	**0.17**	**4.0**	-	0.24	29	**257**	-	-[1]	-[1]
		SC TT	**5.8**	265	8.1	487	**0.26**	-	-	2.30	40	-	-	-	-
		SC PEN	**8.1**	275	7.8	409	**0.17**	**3.5**		3.23	38	23	12	<6.5	<6.5
% Total Exceedences			**77**	0	0	0	**96**	**74**	0	0	0	**52**	0	0	0
% Exceedences - Drought Yr			**63**	0	0	0	0	**100**	0	0	0	**20**	0	0	0
% Exceedences - Average Yr			**71**	0	0	0	**100**	**70**	0	0	0	**50**	0	0	0
% Exceedences - Wet Yr			**92**	0	0	0	**91**	**67**	0	0	0	**70**	0	0	0
% Exceedences - Dry Season			**89**	0	0	0	**93**	**58**	0	0	0	**58**	0	0	0
% Exceedences - Wet Season			**65**	0	0	0	**100**	**91**	0	0	0	**69**	0	0	0

[1] One of seven samples tested positive (.25) during this sampling period; other samples were below detection limits.

Legend

Turb: Turbidity
TDS: Total Dissolved Solids
pH: Hydrogen ion concentration
Spec EC: Specific Electric Conductance
TOC: Total Organic Carbon
Br: Bromide
NO_2: Nitrite
NO_3: Nitrate
SO_4: Sulfate
Colif: Total Coliform Bacteria
Fec Colif: Fecal Coliform Bacteria
Crypt: Cryptosporidium
Giard: Total Giardia
WQO: Water Quality Objective
MCL: Maximum Contaminant Level
SMCL; Secondary MCL
LT2: EPA Long-Term Enhanced Surface Water Treatment Rule

Banks: Banks Pumping Plant Autostation
PPWTP: Patterson Pass Water Treatment Plant
DV Chk7: Del Valle #7 Autostation
DVWTP: Del Valle Water Treatment Plant
Vallecitos: Vallecitos Autostation
ACWD: Alameda County Water District Water Treatment Plant
SC TT: Santa Clara Terminal Tank
SC PEN: Santa Clara Penitencia Water Trtmt Plant

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Appendix A: Statistical Summaries of Water Quality Indicator Data
By Sampling Location, Water Year, and Wet/Dry Season

Table A-1. **Alameda County Water District** Water Quality Data, Water Treatment Plants, Raw Water: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 1990 and April 1991 - September 1991																			
# Samples	NA	1	1	1	1	1	1	1	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA
Min	NA	15.4	235	7.9	385	82	104	48	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Max	NA	15.4	235	7.9	385	82	104	48	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	1	2	1	1	2	2	2	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA
Min	NA	1.8	382	7.8	705	80	140	131	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Max	NA	1.8	387	7.8	705	100	142	134	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	385	NA	NA	90	141	133	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	385	NA	NA	90	141	133	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	383	NA	NA	82	140	131	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	387	NA	NA	98	142	134	NA	NA	NA	3.00	NA	NA	NA	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L as NO_3)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate mg/L
SO_4: Sulfate (mg/L)
Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-2. **Alameda County Water District** Water Quality Data, Water Treatment Plants, Raw Water: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 2001 and April 2002 - September 2002																			
# Samples	99	209	2	209	211	211	208	211	29	30	2	2	2	NA	2	204	NA	NA	NA
Min	14.2	2.3	208	7.3	240	52	68	28	0.09	2.1	<400	<2	<400	NA	34	5	NA	NA	NA
Max	25.5	56.0	316	8.9	711	145	164	148	0.46	4.2	<400	2	460	NA	36	24192	NA	NA	NA
Mean	20.8	**10.5**	262	8.0	425	82	101	74	**0.21**	**3.1**	NA	NA	NA	NA	35	**1721**	NA	NA	NA
Median	21.1	7.9	262	7.9	386	80	100	55	0.14	3.0	NA	NA	NA	NA	35	2419	NA	NA	NA
Percentile 10	17.3	4.0	219	7.8	268	66	78	33	0.09	2.2	NA	NA	NA	NA	34	125	NA	NA	NA
Percentile 90	24.2	19.6	305	8.1	647	96	124	129	0.39	4.0	NA	NA	NA	NA	36	9804	NA	NA	NA
Wet Season: Nov 2001 - Mar 2002																			
# Samples	41	107	1	107	104	106	104	106	15	15	1	1	1	NA	1	101	NA	NA	NA
Min	11.3	1.0	252	7.4	204	78	88	27	0.10	2.7	<400	<2	<400	NA	36	1	NA	NA	NA
Max	18.8	21.1	252	8.9	656	158	188	134	0.24	4.5	<400	<2	<400	NA	36	2909	NA	NA	NA
Mean	13.4	2.7	NA	8.0	420	129	149	46	**0.12**	**3.7**	NA	NA	NA	NA	NA	62	NA	NA	NA
Median	12.8	1.4	NA	8.1	420	138	158	39	0.11	4.0	NA	NA	NA	NA	NA	109	NA	NA	NA
Percentile 10	11.5	1.2	NA	7.7	319	86	103	33	0.10	2.8	NA	NA	NA	NA	NA	3	NA	NA	NA
Percentile 90	17.3	7.4	NA	8.3	503	150	168	79	0.12	4.2	NA	NA	NA	NA	NA	1317	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (ug/L as N)
NO_3: Nitrate (mg/L as NO_3)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate mg/L
SO_4: Sulfate (mg/L)
Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-3. **Alameda County Water District** Water Quality Data, Water Treatment Plants, Raw Water: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: June 1998 - September, 1998																			
# Samples	50	123	1	123	114	114	113	114	21	20	2	2	NA	NA	2	59	116	4	4
Min	18.5	3.5	94	7.3	113	34	36	8	0.04	2.4	<0.01	0.18	NA	NA	21	23	2	<.09	<.09
Max	26.6	35.0	94	8.3	281	120	166	51	0.08	3.7	NA	1.03	NA	NA	44	>1600	130	<.93	<.93
Mean	22.1	**12.9**	NA	7.8	206	74	81	22	**0.06**	**3.0**	NA	0.61	NA	NA	32	**423**	10	NA	NA
Median	22.0	12.6	NA	7.8	224	72	84	22	0.06	3.0	NA	0.61	NA	NA	32	500	8	NA	NA
Percentile 10	19.5	6.6	NA	7.6	128	40	44	15	0.05	2.6	NA	0.27	NA	NA	23	170	2	NA	NA
Percentile 90	24.7	20.8	NA	8.0	260	101	114	30	0.07	3.5	NA	0.95	NA	NA	41	1600	20	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	91	200	2	200	191	191	191	191	34	33	2	2	NA	NA	2	157	152	7	7
Min	9.4	1.6	222	7.0	191	57	64	4	0.02	2.7	<0.01	0.16	NA	NA	23	6	2	<.05	<.05
Max	18.8	110.0	226	8.8	596	170	186	180	0.46	5.4	<0.01	0.32	NA	NA	34	1600	500	<.25	<.25
Mean	13.7	**15.5**	224	7.7	374	108	132	57	**0.17**	**4.0**	NA	0.24	NA	NA	29	**257**	29	NA [1]	NA [1]
Median	12.9	9.9	224	7.6	391	112	132	63	0.20	4.0	NA	0.24	NA	NA	29	240	13	NA [1]	NA [1]
Percentile 10	11.1	3.9	222	7.2	241	74	102	7	0.02	3.1	NA	0.18	NA	NA	24	30	2	NA [1]	NA [1]
Percentile 90	17.5	39.1	226	8.3	511	148	164	116	0.33	5.2	NA	0.30	NA	NA	33	1600	50	NA [1]	NA [1]

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}$[H+]
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L as NO_3)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate mg/L
SO_4: Sulfate (mg/L)
Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Footnotes: [1]. Mean, median, and percentiles could not be calculated for Crypto and Giardia because only one sample tested positive

Table A-4. **Zone 7 Water Agency** Water Quality Data, Water Treatment Plants, Raw Water: **Dry Year** October 1990 – September 1991. DVWTP = Del Valle Water Treatment Plant; PPWTP = Patterson Pass Water Treatment Plant. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO_4	SO_4	Colif	E. coli	Crypto	Giardia
DVWTP Inlet																			
Dry Season: October 1990 and April 1991 - September 1991																			
# Samples	NA	2	2	2	2	2	2	2	NA	NA	NA	2	NA	NA	2	20	NA	NA	NA
Min	NA	1.9	256	7.7	427	69	87	72	NA	NA	NA	0.97	NA	NA	21	7	NA	NA	NA
Max	NA	7.5	291	8.0	550	78	112	95	NA	NA	NA	1.20	NA	NA	29	1600	NA	NA	NA
Mean	NA	4.7	274	7.9	489	74	100	84	NA	NA	NA	1.09	NA	NA	25	65	NA	NA	NA
Median	NA	4.7	274	7.9	489	74	100	84	NA	NA	NA	1.09	NA	NA	25	60	NA	NA	NA
Percentile 10	NA	2.5	260	7.7	439	70	90	74	NA	NA	NA	1.00	NA	NA	22	17	NA	NA	NA
Percentile 90	NA	6.9	288	8.0	538	77	110	93	NA	NA	NA	1.18	NA	NA	28	222	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	4	4	4	4	4	4	4	NA	NA	NA	4	NA	NA	4	7	NA	NA	NA
Min	NA	1.00	354	7.5	649	76	118	33	NA	NA	NA	0.89	NA	NA	33	2	NA	NA	NA
Max	NA	7.5	446	7.9	783	116	161	160	NA	NA	NA	19.92	NA	NA	55	23	NA	NA	NA
Mean	NA	3.5	394	7.7	710	88	138	140	NA	NA	NA	6.08	NA	NA	44	8	NA	NA	NA
Median	NA	2.7	388	7.7	705	81	137	152	NA	NA	NA	1.75	NA	NA	45	8	NA	NA	NA
Percentile 10	NA	1.2	357	7.6	654	77	122	113	NA	NA	NA	0.93	NA	NA	36	3	NA	NA	NA
Percentile 90	NA	6.3	436	7.8	771	106	156	159	NA	NA	NA	14.69	NA	NA	53	23	NA	NA	NA
PPWTP Inlet																			
Dry Season: October 1990 and April 1991 - September 1991																			
# Samples	NA	7	7	7	7	7	7	7	NA	NA	NA	7	NA	NA	7	20	NA	NA	NA
Min	NA	1.1	214	7.2	410	64	90	44	NA	NA	NA	0.21	NA	NA	26	11	NA	NA	NA
Max	NA	18.0	336	8.2	608	94	118	118	NA	NA	NA	6.11	NA	NA	39	170	NA	NA	NA
Mean	NA	**6.7**	271	7.8	500	78	105	78	NA	NA	NA	2.33	NA	NA	32	65	NA	NA	NA
Median	NA	6.0	276	7.7	490	81	105	75	NA	NA	NA	2.10	NA	NA	33	70	NA	NA	NA
Percentile 10	NA	1.2	224	7.4	440	67	93	45	NA	NA	NA	0.67	NA	NA	27	23	NA	NA	NA
Percentile 90	NA	12.2	310	8.1	573	89	117	111	NA	NA	NA	4.30	NA	NA	37	170	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	8	8	8	8	8	8	8	NA	NA	NA	8	NA	NA	8	28	NA	NA	NA
Min	NA	1.8	343	7.3	684	76	133	134	NA	NA	NA	0.97	NA	NA	36	2	NA	NA	NA
Max	NA	5.8	432	8.4	762	92	143	153	NA	NA	NA	27.45	NA	NA	53	130	NA	NA	NA
Mean	NA	4.0	395	7.9	730	83	137	145	NA	NA	NA	9.31	NA	NA	45	8	NA	NA	NA
Median	NA	4.1	402	7.9	737	82	137	146	NA	NA	NA	4.40	NA	NA	45	8	NA	NA	NA
Percentile 10	NA	2.3	360	7.4	700	77	133	137	NA	NA	NA	1.73	NA	NA	39	2	NA	NA	NA
Percentile 90	NA	5.5	424	8.3	755	90	142	152	NA	NA	NA	20.81	NA	NA	51	30	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)

Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)

NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-5. **Zone 7 Water Agency** Water Quality Data, Water Treatment Plants, Raw Water: **Average Year** October 2001 – September 2002. DVWTP = Del Valle Water Treatment Plant; PPWTP = Patterson Pass Water Treatment Plant. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO_4	SO_4	Colif	E. coli	Crypto	Giardia
DVWTP Inlet																			
Dry Season: October 2001 and April 2002 - September 2002																			
# Samples	41	41	9	9	9	41	9	9	8	42	3	8	0	7	9	24	34	2	2
Min	14.1	0.8	162	7.1	252	68	77	36	0.09	1.6	< 0.02	0.22	<0.05	0.07	14	25	0.0	< 0.1	< 0.1
Max	25.2	46.2	360	8.2	686	149	174	135	0.43	3.8	< 0.02	2.21	<0.05	0.09	43	2000	22.2	< 0.4	< 0.4
Mean	20.8	**9.8**	269	7.9	473	84	115	73	**0.22**	2.6	NA	1.03	NA	0.08	32	**472**	6.5	NA	NA
Median	21.1	6.3	262	8.0	446	81	102	59	0.19	2.5	NA	0.82	NA	0.08	35	820	4.8	NA	NA
Percentile 10	17.6	3.6	207	7.5	340	71	88	38	0.10	1.9	NA	0.28	NA	0.07	19	83	0.0	NA	NA
Percentile 90	23.5	22.1	342	8.1	630	93	156	123	0.38	3.4	NA	2.06	NA	0.09	41	1180	14.2	NA	NA
Wet Season: Nov 2001 - Mar 2002																			
# Samples	4	18	4	4	4	18	4	4	4	17	NA	3	0	2	4	14	14	2	2
Min	11.6	0.6	200	7.7	309	86	91	37	0.10	3.0	NA	0.27	<0.05	<0.05	24	14	0.0	< 0.1	< 0.1
Max	13.8	8.0	264	8.1	458	144	170	44	0.17	5.0	NA	2.43	<0.05	0.05	41	885	12.4	< 0.1	< 0.1
Mean	12.4	2.3	244	8.0	401	127	148	40	**0.12**	**3.7**	NA	1.02	NA	NA	36	43	1.9	NA	NA
Median	12.1	1.5	255	8.0	418	136	165	40	0.11	3.7	NA	0.35	NA	NA	39	26	0.5	NA	NA
Percentile 10	11.7	1.0	214	7.8	335	89	112	38	0.10	3.4	NA	0.28	NA	NA	29	16	0.0	NA	NA
Percentile 90	13.3	6.2	264	8.1	453	143	170	43	0.16	3.9	NA	2.02	NA	NA	40	321	3.9	NA	NA
PPWTP Inlet																			
Dry Season: October 2001 and April 2002 - September 2002																			
# Samples	6	6	6	6	6	6	6	6	6	7	3	6	9	7	6	20	34	2	2
Min	18.8	1.6	164	7.6	243	69	76	36	0.09	2.0	< 0.02	1.15	<0.05	< 0.05	14	48	0.0	< 0.1	< 0.1
Max	26.1	8.1	376	8.0	681	92	119	138	0.44	3.1	< 0.02	2.43	<0.05	0.08	41	2000	19.2	< 0.1	< 0.1
Mean	22.1	4.5	261	7.8	445	81	100	75	**0.22**	2.5	NA	1.73	NA	NA	30	**568**	2.7	NA	NA
Median	22.0	4.6	224	7.8	388	82	102	51	0.12	2.5	NA	1.62	NA	NA	32	1010	1.0	NA	NA
Percentile 10	19.2	2.0	184	7.7	268	73	84	39	0.10	2.1	NA	1.17	NA	NA	20	105	0.0	NA	NA
Percentile 90	25.1	6.9	376	8.0	678	88	115	136	0.44	3.0	NA	2.39	NA	NA	40	1505	6.4	NA	NA
Wet Season: Nov 2001 - Mar 2002																			
# Samples	11	11	3	11	3	11	3	3	3	11	NA	3	2	1	3	9	9	1	1
Min	11.3	0.1	248	7.7	361	80	109	50	0.14	1.2	NA	1.28	<0.05	0.05	30	31	1.0	< 0.1	< 0.1
Max	18.0	8.3	350	8.5	649	96	122	131	0.39	4.0	NA	3.36	<0.05	0.05	34	453	27.1	< 0.1	< 0.1
Mean	13.9	3.4	307	8.0	526	89	114	94	**0.28**	2.9	NA		NA	NA	32	**156**	10.5	NA	NA
Median	13.3	3.3	324	8.0	569	89	110	102	0.30	2.7	NA	2.52	NA	NA	31	165	9.9	NA	NA
Percentile 10	11.7	1.5	263	7.7	403	81	109	60	0.17	2.5	NA	1.53	NA	NA	30	110	1.8	NA	NA
Percentile 90	16.6	6.1	345	8.3	633	94	120	125	0.37	4.0	NA	3.20	NA	NA	33	294	20.8	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L as N)
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-6 **Zone 7 Water Agency** Water Quality Data, Water Treatment Plants, Raw Water: **Wet Year** October 1997 – September 1998
DVWTP = Del Valle Water Treatment Plant; PPWTP = Patterson Pass Water Treatment Plant. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO_4	SO_4	Colif	E. coli	Crypto	Giardia
DVWTP Inlet																			
Dry Season: June 1998 - September, 1998																			
# Samples	5	5	5	5	5	5	5	5	3	5	2	4	1	NA	5	13	19	4	4
Min	20.0	2.2	99	7.4	163	41	38	14	0.05	2.8	< 0.02	0.75	0.17	NA	15	50	0.0	< .049	< .049
Max	23.8	16.0	193	8.3	337	105	118	25	0.10	3.0	< 0.02	1.90	0.17	NA	30	1003	27.1	< .56	< .56
Mean	22.2	**9.0**	156	7.7	267	77	85	19	**0.07**	2.9	NA	1.39	NA	NA	23	**270**	5.5	NA	NA
Median	22.4	10.0	183	7.7	305	93	101	21	0.06	2.9	NA	1.46	NA	NA	24	280	3.1	NA	NA
Percentile 10	20.7	2.8	107	7.4	188	45	47	14	0.05	2.8	NA	0.94	NA	NA	17	97	0.0	NA	NA
Percentile 90	23.4	14.8	189	8.1	324	101	114	24	0.09	3.0	NA	1.80	NA	NA	29	920	14.0	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	9	9	9	9	9	9	9	9	5	9	1	8	1	NA	9	32	35	8	8
Min	10.6	2.1	168	7.6	278	66	94	5	0.18	2.5	< 0.02	0.89	0.05	NA	22	9	0.0	<.016	<.016
Max	18.8	68.0	293	7.9	514	137	157	103	0.60	4.3	< 0.02	5.18	0.05	NA	52	1445	109.1	< .218	< .218
Mean	13.8	**15.3**	233	7.7	422	105	123	46	**0.42**	**3.6**	NA	1.93	NA	NA	33	**186**	19.1	NA	NA
Median	11.9	4.5	240	7.8	459	110	125	61	0.40	3.7	NA	1.35	NA	NA	31	202	8.7	NA	NA
Percentile 10	10.8	3.0	177	7.6	302	75	94	6	0.27	2.7	NA	0.92	NA	NA	23	23	0.0	NA	NA
Percentile 90	17.9	44.8	275	7.9	505	137	145	82	0.56	4.3	NA	3.13	NA	NA	42	985	58.7	NA	NA
PPWTP Inlet																			
Dry Season: June 1998 - September, 1998																			
# Samples	5	5	5	5	4	5	5	5	4	5	2	5	1	NA	5	17	19	4	4
Min	20.5	2.7	98	7.3	161	38	39	16	0.05	2.3	< 0.02	0.66	0.18	NA	15	22	0.0	< .098	< .098
Max	25.1	8.5	155	8.2	242	73	74	31	0.10	2.7	< 0.02	2.30	0.18	NA	22	826	3.1	< 1.225	< 1.225
Mean	23.1	**5.5**	129	7.7	207	54	56	22	**0.07**	2.5	NA	1.47	NA	NA	18	**110**	0.7	NA	NA
Median	23.2	6.1	141	7.7	213	57	62	20	0.07	2.6	NA	1.77	NA	NA	18	101	0.0	NA	NA
Percentile 10	21.4	2.7	100	7.4	168	39	41	17	0.05	2.3	NA	0.72	NA	NA	15	31	0.0	NA	NA
Percentile 90	24.6	8.1	153	8	242	69	69	29	0.09	2.7	NA	2.11	NA	NA	21	484	2.0	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	8	9	9	9	9	9	9	9	9	9	1	9	2	NA	9	33	33	8	8
Min	9.8	0.8	133	7.6	235	61	73	24	0.06	2.4	0.00	1.55	0.07	NA	17	0	0.0	< .038	< .038
Max	18.0	14.0	344	8.9	626	111	126	124	0.90	4.8	0.00	7.53	0.10	NA	71	1003	101.3	< .196	< .196
Mean	14.2	4.3	291	8.0	526	82	104	85	**0.46**	**3.8**	NA	3.81	0.09	NA	43	64	18.1	NA	NA
Median	14.3	2.9	300	7.9	546	74	106	86	0.40	4.2	NA	3.98	0.09	NA	37	111	6.4	NA	NA
Percentile 10	10.8	1.2	239	7.7	436	63	88	63	0.20	2.4	NA	1.58	0.07	NA	24	12	0.2	NA	NA
Percentile 90	18.0	8.0	338	8.3	609	104	120	113	0.74	4.6	NA	6.50	0.10	NA	65	424	54.9	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L as N)
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform Bacteria (MPN/100mL)
E.Coli: Escherichia coli Bacteria (MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-7 **Santa Clara Valley Water District** Water Quality Data, Penitencia Water Treatment Plant, Raw Water: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO_4	SO_4	Total Col	E. Coli	Crypto	Giardia	Fecal Col	Entero
Dry Season: October 1990 and April 1991 - September 1991																					
# Samples	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	NA	NA	NA	NA	NA
Minimum	13.3	6.8	262	7.8	415	76	102	48	0.16	3.3	< 0.05	0.576	< 0.05	0.27	26	28	NA	NA	NA	NA	NA
Maximum	24.3	17.6	340	8.1	596	91	122	108	0.48	6.7	0.005	4.427	0.05	0.51	40	82	NA	NA	NA	NA	NA
Mean	19.2	**10.5**	286	7.9	502	84	112	80	**0.32**	**4.6**	NA	2.24	NA	0.34	35.14	54	NA	NA	NA	NA	NA
Median	20.6	9.5	269	7.9	486	110	80	269	0.29	4.5	NA	1.771	NA	0.3	36	50	NA	NA	NA	NA	NA
Percentile 10	14.6	7.5	263	7.8	423	77	104	55	0.22	3.5	NA	1.05	NA	0.29	28.4	34	NA	NA	NA	NA	NA
Percentile 90	23.2	14.1	329	8.0	574	90	120	104	0.45	5.7	NA	3.90	NA	0.44	40	81	NA	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																					
# Samples	5	5	5	5	5	5	5	5	5	5	2	5	0	5	5	5	NA	NA	NA	NA	NA
Minimum	6.5	4.0	379	7.6	657	76	134	122	0.35	3.7	0.004	1.328	< 0.05	<0.15	45	40	NA	NA	NA	NA	NA
Maximum	20.5	18.0	530	8.1	902	90	162	167	0.56	5.3	0.011	4.737	< 0.05	0.24	58	290	NA	NA	NA	NA	NA
Mean	12.6	**8.4**	438	8.0	768	84	142	146	**0.47**	**4.6**	0.008	3.232	NA	0.23	51.8	**149**	NA	NA	NA	NA	NA
Median	11.3	7.2	417	8	730	86	136	139	0.46	4.7	0.008	3.984	NA	0.23	51	130	NA	NA	NA	NA	NA
Percentile 10	8.2	4.2	384	7.8	685	77	134	127	0.38	3.9	0.005	1.61	NA	0.21	46.6	64	NA	NA	NA	NA	NA
Percentile 90	17.9	14.1	507	8.1	870	90	155	167	0.56	5.2	0.01	4.471	NA	0.24	57.2	248	NA	NA	NA	NA	NA

Legend:

T: Temperature (Celsius)
Turb: Turbidity (NTU)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}$[H+]
Spec EC: Specific Electric Conductance (umhos/cm)
NA: Not Applicable; no data or insufficient data available

Alk: Total Alkalinity (mg/L as CaC03)
Hard: Total Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)

NO_2N: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Total Col: Total Coliform Bacteria (MPN/100mL)
Fecal Col: Fecal Coliform Bacteria (MPN/100mL)
E.Coli: *Escherichia coli* Bacteria: (MPN/100 mL)
Crypto: Cryptosporidium (# Oocysts/L)
Giardia: Total Giardia (#Cysts/L)
Entero: Enterococcus Bacteria (CFU/100mL)

Table A-8. **Santa Clara Valley Water District** Water Quality Data, Penitencia Water Treatment Plant, Raw Water: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO4	SO_4	Colif	E. Coli	Crypto	Giardia	Fecal Col	Entero
Dry Season: October 2001; April - September 2002																					
# Samples	88	92	6	89	77	77	82	77	26	98	2	11	6	24	26	19	20	5	5	20	37
Min	16.7	0.3	130	7.4	247	55	66	27	0.09	2.1	<0.005	2	<0.05	0.11	17	13	2	<0.05	<0.05	2	1
Max	25.0	37.0	310	8.2	670	94	122	117	0.37	4.6	<0.005	3.16	<0.05	0.28	51	170	70	<0.1	<0.1	70	17
Mean	21.2	**9.2**	247	8.0	455	73	92	77	**0.22**	**3.6**	NA	2.64	NA	0.19	30	36	13.8	NA	NA	8	5.6
Median	21.0	7.1	255	8.0	457	70	90	86	0.17	2.8	NA	2.65	NA	0.185	27	50	7	NA	NA	6	4
Percentile 10	18.9	2.6	175	7.9	292	65	74	29	0.09	2.8	NA	2.23	NA	0.123	18	13	2	NA	NA	4	1
Percentile 90	23.0	18.0	310	8.1	608	86	114	114	0.35	4.4	NA	3.09	NA	0.254	44	80	34	NA	NA	32	14.2
Wet Season: Nov 2001 - Mar 2002																					
# Samples	1	1	1	1	1	1	1	1	1	NA	1	1	1	1	1	6	5	NA	NA	5	NA
Min	10.6	8.8	120	7.4	280	87	98	36	0.09	NA	ND	3.88	<0.05	0.18	30	7	2	NA	NA	2	NA
Max	10.6	8.8	120	7.4	280	87	98	43	0.09	NA	ND	3.88	<0.05	0.18	30	70	30	NA	NA	50	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	12.6	NA	NA	9	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22	13	NA	NA	8	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	2.8	NA	NA	4	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	60	25.2	NA	NA	39	NA

Legend:

T: Temperature (Celsius)
Turb: Turbidity (NTU)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
NA: Not Applicable; insufficient or no data available

Alk: Total Alkalinity (mg/L as CaC03)
Hard: Total Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
ND: Non-detect; detection limit not available

NO_2: Nitrite (mg/L)
NO_3: Nitrate (mg/L
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate mg/L
SO_4: Sulfate (mg/L)

Colif: Total Coliform Bacteria (MPN/100mL)
Fecal Col: Fecal Coliform Bacteria (MPN/100mL)
E.Coli: *Escherichia coli* Bacteria: (MPN/100 mL)
Crypto: Cryptosporidium (# Oocysts/L)
Giardia: Total Giardia (#Cysts/L)
Entero: *Enterococcus* Bacteria (CFU/100mL)

Table A-9. **Santa Clara Valley Water District** Water Quality Data, Penitencia Water Treatment Plant, Raw Water: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	NH_3	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia	Fecal Col	Entero
Dry Season: June - September, 1998																					
# Samples	119	90	7	95	86	91	91	88	7	10	4	5	5	7	7	22	22	4	4	22	NA
Min	59.0	2.8	122	7.0	125	30	34	12	0.05	2.4	ND	1.48	<0.05	0.08	16	4	2	<4.7	<4.7	2	NA
Max	120.0	25.0	270	9.3	316	109	125	25	0.1	3.0	ND	1.96	<0.05	0.34	30	1600	23	<9.7	<9.7	23	NA
Mean	79.2	**11.4**	169	7.9	227	61	72	19	**0.06**	2.6	ND	1.76	NA	0.19	24	**106**	8	NA	NA	7	NA
Median	74.3	11.0	167	7.9	244	62	76	20	0.06	2.6	ND	1.84	NA	0.21	26	23	8	NA	NA	8	NA
Percentile 10	67.8	5.3	122	7.5	144	33	58	14	0.05	2.4	ND	1.54	NA	0.09	17	13	2	NA	NA	2	NA
Percentile 90	105.4	19.1	220	8.2	291	87	102	23	0.08	3.0	ND	1.94	NA	0.29	29	80	13	NA	NA	14	NA
Wet Season: October 1997 - May, 1998																					
# Samples	176	165	12	170	159	172	171	165	14	19	7	7	7	12	12	37	37	7	7	37	NA
Min	48.4	1.3	209	7.1	212	0	53	8	0.03	2.6	ND	0.24	<0.05	<0.05	<0.05	2	2	<4.3	<4.3	2	NA
Max	72.7	45.0	325	8.7	573	143	161	134	0.26	4.5	ND	6.44	0.08	0.33	64	240	30	<9.8	<9.8	170	NA
Mean	58.4	**8.1**	275	7.8	409	87	115	63	**0.17**	**3.5**	ND	3.23	NA	0.22	38	37	10	NA	NA	12	NA
Median	56.7	5.7	274	7.8	413	86	113	68	0.18	3.2	ND	3.7	NA	0.22	36	23	8	NA	NA	12	NA
Percentile 10	53.0	2.2	223	7.4	312	62	93	21	0.08	2.6	ND	0.24	NA	0.17	32	4	2	NA	NA	2	NA
Percentile 90	64.9	18.2	315	8.2	522	115	139	100	0.23	4.4	ND	5.44	NA	0.27	41	80	26	NA	NA	50	NA

Legend:

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
NA: Not Applicable; no data or insufficient data available

Alk: Total Alkalinity (mg/L as CaC03)
Hard: Total Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
ND: Non-detect; detection limit not available

NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L
NH_3: Ammonia (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Total Col: Total Coliform Bacteria (MPN/100mL)
Fecal Col: Fecal Coliform Bacteria (MPN/100mL)
E.Coli: *Escherichia coli* Bacteria: (MPN/100 mL)
Crypto: Cryptosporidium (# Oocysts/L)
Giardia: Total Giardia (#Cysts/L)
Entero: Enterococcus Bacteria (CFU/100mL)

Table A-10. Department of Water Resources Water Quality Data, **Banks Pumping Plant**: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 1990, April - September, 1991																			
# Samples	204	120	188	204	7	7	7	7	6	7	NA	NA	NA	NA	7	NA	NA	NA	NA
Min	14.0	1.5	5.9	332	65	95	37	194	0.14	3.2	NA	NA	NA	NA	25	NA	NA	NA	NA
Max	26.2	61.6	8.3	712	85	154	124	342	0.35	7.4	NA	NA	NA	NA	38	NA	NA	NA	NA
Mean	20.2	**13.7**	7.4	509	75	113	93	282	0.27	**4.6**	NA	NA	NA	NA	31	NA	NA	NA	NA
Median	20.4	**13.7**	7.6	516	78	108	102	276	0.32	4.4	NA	NA	NA	NA	33	NA	NA	NA	NA
Percentile 10	16.4	3.5	6.4	404	66	96	47	217	0.15	3.3	NA	NA	NA	NA	25	NA	NA	NA	NA
Percentile 90	23.9	22.5	7.9	617	83	132	122	341	0.35	6.1	NA	NA	NA	NA	36	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	81	80	72	79	5	5	5	5	3	5	NA	NA	NA	NA	5	NA	NA	NA	NA
Min	4.4	2.5	5.3	693	74	120	128	363	0.44	3.2	NA	NA	NA	NA	41	NA	NA	NA	NA
Max	18.2	48.8	7.7	1061	78	145	175	466	0.52	5.4	NA	NA	NA	NA	60	NA	NA	NA	NA
Mean	9.6	**9.0**	7.4	845	76	137	150	415	0.47	**4.6**	NA	NA	NA	NA	50	NA	NA	NA	NA
Median	9.3	**7.2**	7.5	815	76	139	150	415	0.45	5.3	NA	NA	NA	NA	54	NA	NA	NA	NA
Percentile 10	4.8	5.7	7.2	759	74	126	134	377	0.44	3.4	NA	NA	NA	NA	41	NA	NA	NA	NA
Percentile 90	14.3	12.2	7.6	1028	77	144	167	452	0.51	5.4	NA	NA	NA	NA	58	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-11. Department of Water Resources Water Quality Data, **Banks Pumping Plant**: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 2001, April - September, 2002																			
# Samples	186	208	211	211	7	7	7	7	7	7	7	7	7	NA	7	6	7	NA	NA
Min	14.9	3.3	6.8	252	60	72	31	168	0.09	2.3	0.01	0.80	0.20	NA	15	23	2	NA	NA
Max	26.8	71.8	8.6	693	86	113	112	409	0.37	5.2	0.11	2.70	0.60	NA	42	50	27	NA	NA
Mean	20.6	**13.0**	8.1	448	74	94	57	261	0.19	**3.5**	0.05	1.49	0.34	NA	24	31	7	NA	NA
Median	20.6	9.8	8.2	416	74	98	47	222	0.16	3.2	0.06	1.60	0.40	NA	23	30	4	NA	NA
Percentile 10	16.9	5.4	7.7	291	64	75	32	171	0.09	2.4	0.01	0.86	0.20	NA	16	27	2	NA	NA
Percentile 90	24.5	24.0	8.3	658	82	112	88	377	0.29	4.8	0.09	2.10	0.48	NA	34	40	16	NA	NA
Wet Season: November 2001 - March 2002																			
# Samples	149	149	143	149	5	5	5	5	5	5	5	5	5	NA	5	5	5	NA	NA
Min	7.7	3.2	7.4	290	69	95	43	202	0.12	2.5	0.01	3.10	0.40	NA	32	80	80	NA	NA
Max	18.2	60.2	8.8	673	92	111	89	308	0.30	8.4	0.23	6.50	0.57	NA	44	500	900	NA	NA
Mean	11.9	**12.9**	8.2	437	79	101	62	256	0.19	**5.1**	0.09	4.20	0.45	NA	37	**222**	274	NA	NA
Median	11.3	11.0	8.2	413	77	99	49	263	0.15	4.5	0.05	3.80	0.40	NA	37	300	90	NA	NA
Percentile 10	8.8	5.1	7.8	312	72	97	44	214	0.12	3.2	0.02	3.22	0.40	NA	33	84	80	NA	NA
Percentile 90	16.0	19.9	8.5	603	88	108	87	295	0.28	7.3	0.18	5.58	0.54	NA	41	500	628	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}$[H+]
Spec EC: Specific Electric Conductance (umhos/cm)

Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)

NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-12. Department of Water Resources Water Quality Data, **Banks Pumping Plant**: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: June - September, 1998																			
# Samples	111	109	111	111	4	4	4	4	3	NA	NA	NA	NA	NA	4	3	3	NA	NA
Min	17.8	7.6	6.2	123	33	38	12	85	0.04	NA	NA	NA	NA	NA	16	2	2	NA	NA
Max	27.3	93.5	9.8	319	60	64	20	139	0.06	NA	NA	NA	NA	NA	22	220	2	NA	NA
Mean	22.6	20.3	7.8	226	46	54	17	115	0.05	NA	NA	NA	NA	NA	20	10	2	NA	NA
Median	22.4	16.0	7.6	223	45	57	19	118	0.06	NA	NA	NA	NA	NA	21	2	2	NA	NA
Percentile 10	19.0	9.7	6.8	144	35	41	14	95	0.04	NA	NA	NA	NA	NA	17	2	2	NA	NA
Percentile 90	25.9	32.5	8.6	303	57	64	20	133	0.06	NA	NA	NA	NA	NA	22	176	2	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	239	239	239	239	8	8	8	8	8	7	NA	NA	NA	NA	8	7	4	NA	NA
Min	6.7	1.2	6.6	246	62	82	46	212	0.13	2.8	NA	NA	NA	NA	26	29	2	NA	NA
Max	22.7	56.3	8.3	765	95	121	127	399	0.44	5.2	NA	NA	NA	NA	77	300	240	NA	NA
Mean	13.9	7.4	7.2	527	72	102	83	291	0.27	**4.2**	NA	NA	NA	NA	45	**109**	112	NA	NA
Median	14.1	4.8	7.0	521	71	102	89	276	0.27	4.5	NA	NA	NA	NA	46	130	102	NA	NA
Percentile 10	9.4	2.1	6.8	398	63	86	54	244	0.15	2.9	NA	NA	NA	NA	27	30	24	NA	NA
Percentile 90	18.2	13.5	7.9	670	82	118	107	356	0.41	5.0	NA	NA	NA	NA	62	300	207	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-13. Department of Water Resources Water Quality Data, **Del Valle Check 7 Station**: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 1990, April - September, 1991																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}$[H+]
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-14. Department of Water Resources Water Quality Data, **Del Valle Check 7 Station**: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 2001, April - September, 2002																			
# Samples	213	213	7	5.0	213	7	7	7	7	6	7	7	7	NA	7	NA	NA	NA	NA
Min	14.6	1.4	168	6.6	262	64	72	33	0.09	2.5	0.00	0.80	0.30	NA	15	NA	NA	NA	NA
Max	26.9	47.7	388	8.1	702	85	113	117	0.39	5.8	0.10	2.70	0.40	NA	40	NA	NA	NA	NA
Mean	20.5	**12.6**	267	7.3	454	74	93	58	0.19	3.8	0.05	1.41	0.33	NA	24	NA	NA	NA	NA
Median	20.5	10.4	219	7.4	437	76	98	45	0.17	3.8	0.06	1.20	0.30	NA	24	NA	NA	NA	NA
Percentile 10	16.6	5.9	178	6.7	301	64	75	34	0.10	2.7	0.00	0.80	0.30	NA	16	NA	NA	NA	NA
Percentile 90	24.5	21.9	375	7.8	650	82	112	89	0.29	5.1	0.09	2.16	0.40	NA	35	NA	NA	NA	NA
Wet Season: November 2001 - March 2002																			
# Samples	38	32	1	NA	38	1	1	1	1	1	1	1	1	NA	1	NA	NA	NA	NA
Min	11.1	4.3	212	NA	305	84	102	44	0.13	9.4	0.03	3.10	1.20	NA	37	NA	NA	NA	NA
Max	17.8	30.4	212	NA	628	84	102	44	0.13	9.4	0.03	3.10	1.20	NA	37	NA	NA	NA	NA
Mean	14.6	**10.1**	NA	NA	408	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	14.2	9.3	NA	NA	341	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	12.2	5.7	NA	NA	311	NA	NA	NA	NA	NA	NA	NA	NA	NA	37	NA	NA	NA	NA
Percentile 90	17.6	15.8	NA	NA	602	NA	NA	NA	NA	NA	NA	NA	NA	NA	37	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}$[H+]
Spec EC: Specific Electric Conductance (umhos/cm)

Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)

NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-15. Department of Water Resources Water Quality Data, **Del Valle Check 7 Station**: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: June - September, 1998																			
# Samples	61	61	4	4	61	4	4	4	NA	NA	NA	4	4	NA	NA	NA	NA	NA	NA
Min	18.4	8.2	85	7.1	112	35	39	14	NA	NA	NA	1.70	17.00	NA	NA	NA	NA	NA	NA
Max	27.2	36.2	139	7.5	266	60	64	22	NA	NA	NA	2.30	23.00	NA	NA	NA	NA	NA	NA
Mean	23.3	**16.1**	118	7.3	233	48	54	19	NA	NA	NA	2.03	21.25	NA	NA	NA	NA	NA	NA
Median	23.5	15.0	124	7.4	238	49	57	20	NA	NA	NA	2.05	22.50	NA	NA	NA	NA	NA	NA
Percentile 10	20.0	8.4	94	7.2	219	37	42	15	NA	NA	NA	1.79	18.50	NA	NA	NA	NA	NA	NA
Percentile 90	26.3	23.3	137	7.5	250	59	64	22	NA	NA	NA	2.24	23.00	NA	NA	NA	NA	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	224	224	5	4	224	5	5	5	NA	NA	NA	5	5	NA	NA	NA	NA	NA	NA
Min	6.8	1.0	248	7.9	256	65	84	57	NA	NA	NA	1.20	25.00	NA	NA	NA	NA	NA	NA
Max	23.5	29.3	349	8.1	738	72	120	131	NA	NA	NA	5.30	51.00	NA	NA	NA	NA	NA	NA
Mean	13.5	**7.4**	283	8.0	398	70	100	89	NA	NA	NA	2.90	37.00	NA	NA	NA	NA	NA	NA
Median	13.6	5.9	274	8.0	440	71	96	86	NA	NA	NA	3.00	37.00	NA	NA	NA	NA	NA	NA
Percentile 10	8.4	3.0	252	7.9	261	67	87	64	NA	NA	NA	1.20	27.80	NA	NA	NA	NA	NA	NA
Percentile 90	18.6	13.6	323	8.1	450	72	116	117	NA	NA	NA	4.70	46.60	NA	NA	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-16. Department of Water Resources Water Quality Data, **Vallecitos Station**: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 1990, April - September, 1991																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Legend: NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-17. Department of Water Resources Water Quality Data, **Vallecitos Station**: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 2001, April - September, 2002																			
# Samples	212	212	NA	184	201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	13.0	2.0	NA	4.5	255	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	28.9	43.1	NA	8.8	755	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	20.3	**13.0**	NA	7.9	474	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	20.5	10.0	NA	8.0	451	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	16.1	4.8	NA	6.8	321	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	24.1	24.6	NA	8.6	677	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: November 2001 - March 2002																			
# Samples	36	24	NA	34	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	9.0	1.2	NA	6.0	298	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	21.0	35.3	NA	8.9	666	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	14.2	**9.5**	NA	7.5	456	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	13.6	6.7	NA	7.7	414	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	11.0	1.6	NA	6.2	327	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	17.7	25.8	NA	8.4	662	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-18. Department of Water Resources Water Quality Data, **Vallecitos Station**: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: June - September, 1998																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Legend: NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-19. Department of Water Resources Water Quality Data, **Santa Clara Terminal Tank**: **Dry Year** October 1990 – September 1991. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 1990, April - September, 1991																			
# Samples	NA	NA	2	2	2	2	2	2	2	NA	NA	2	NA	NA	2	NA	NA	NA	NA
Min	NA	NA	231	7.4	404	73	100	54	0.15	NA	NA	1.60	NA	NA	30	NA	NA	NA	NA
Max	NA	NA	272	7.8	513	81	108	102	0.30	NA	NA	3.10	NA	NA	33	NA	NA	NA	NA
Mean	NA	NA	252	7.6	459	77	104	78	0.23	NA	NA	2.35	NA	NA	32	NA	NA	NA	NA
Median	NA	NA	252	7.6	459	77	104	78	0.23	NA	NA	2.35	NA	NA	32	NA	NA	NA	NA
Percentile 10	NA	NA	235	7.4	415	74	101	59	0.17	NA	NA	1.75	NA	NA	30	NA	NA	NA	NA
Percentile 90	NA	NA	268	7.8	502	80	107	97	0.29	NA	NA	2.95	NA	NA	33	NA	NA	NA	NA
Wet Season: November 1990 - March 1991																			
# Samples	NA	NA	2	2	2	2	2	2	NA	NA	NA	1	NA	NA	2	NA	NA	NA	NA
Min	NA	NA	386	6.9	723	78	136	139	NA	NA	NA	4.90	NA	NA	44	NA	NA	NA	NA
Max	NA	NA	436	7.5	801	88	146	157	NA	NA	NA	4.90	NA	NA	58	NA	NA	NA	NA
Mean	NA	NA	411	7.2	762	83	141	148	NA	NA	NA	NA	NA	NA	51	NA	NA	NA	NA
Median	NA	NA	411	7.2	762	83	141	148	NA	NA	NA	NA	NA	NA	51	NA	NA	NA	NA
Percentile 10	NA	NA	391	7.0	731	79	137	141	NA	NA	NA	NA	NA	NA	45	NA	NA	NA	NA
Percentile 90	NA	NA	431	7.4	793	87	145	155	NA	NA	NA	NA	NA	NA	57	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)

Turb: Turbidity (ntu)

TDS: Total Dissolved Solids (mg/L)

pH: Hydrogen ion concentration as minus $\log_{10}[H+]$

Spec EC: Specific Electric Conductance (umhos/cm)

Alk: Alkalinity (mg/L as CaC03)

Hard: Hardness (mg/L as CaC03)

Cl: Chloride (mg/L)

Br: Bromide (mg/L)

TOC: Total Organic Carbon (mg/L)

NO_2: Nitrite (mg/L as N)

NO_3: Nitrate (mg/L)

N: Total Nitrogen (ug/L as N)

PO_4: Phosphate (mg/L)

SO_4: Sulfate (mg/L)

Colif: Total Coliform (MPN/100mL)

E.Coli: Escherichia coli(MPN/100 mL)

Crypto: Cryptosporidium (#Oocysts/L)

Giardia: Giardia (#Cysts/L)

Table A-20. Department of Water Resources Water Quality Data, **Santa Clara Terminal Tank**: **Average Year** October 2001 – September 2002. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: October 2001, April - September, 2002																			
# Samples	NA	2	2	NA	2	2	2	2	2	NA	NA	2	NA	NA	2	NA	NA	NA	NA
Min	NA	13.0	247	NA	393	66	98	45	0.13	NA	NA	0.90	NA	NA	24	NA	NA	NA	NA
Max	NA	15.0	355	NA	591	80	102	114	0.38	NA	NA	2.80	NA	NA	40	NA	NA	NA	NA
Mean	NA	**14.0**	301	NA	492	73	100	80	0.26	NA	NA	1.85	NA	NA	32	NA	NA	NA	NA
Median	NA	14.0	301	NA	492	73	100	80	0.26	NA	NA	1.85	NA	NA	32	NA	NA	NA	NA
Percentile 10	NA	13.2	258	NA	413	67	98	52	0.16	NA	NA	1.09	NA	NA	26	NA	NA	NA	NA
Percentile 90	NA	14.8	344	NA	571	79	102	107	0.36	NA	NA	2.61	NA	NA	38	NA	NA	NA	NA
Wet Season: November 2001 - March 2002																			
# Samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Min	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Max	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)
Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)
NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)
Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
Giardia: Giardia (#Cysts/L)

Table A-21. Department of Water Resources Water Quality Data, **Santa Clara Terminal Tank**: **Wet Year** October 1997 – September 1998. Bold values indicate seasonal means that exceed the associated water quality standard (see Table 4).

	T	Turb	TDS	pH	Spec EC	Alk	Hard	Cl	Br	TOC	NO_2	NO_3	N	PO_4	SO_4	Colif	E. Coli	Crypto	Giardia
Dry Season: June - September, 1998																			
# Samples	NA	1	1	1	1	1	1	1	1	NA	NA	1	NA	NA	1	NA	NA	NA	NA
Min	NA	18.0	168	7.7	301	89	108	19	0.05	NA	NA	1.80	NA	NA	31	NA	NA	NA	NA
Max	NA	18.0	168	7.7	301	89	108	19	0.05	NA	NA	1.80	NA	NA	31	NA	NA	NA	NA
Mean	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Median	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percentile 90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Season: October 1997 - May 1998																			
# Samples	NA	4	4	4	4	4	4	4	4	NA	NA	4	NA	NA	4	NA	NA	NA	NA
Min	NA	2.0	226	7.9	412	64	90	42	0.19	NA	NA	0.60	NA	NA	30	NA	NA	NA	NA
Max	NA	11.0	280	8.3	521	113	134	96	0.35	NA	NA	4.10	NA	NA	60	NA	NA	NA	NA
Mean	NA	**5.8**	265	8.1	487	85	111	69	0.26	NA	NA	2.30	NA	NA	40	NA	NA	NA	NA
Median	NA	5.0	277	8.0	507	82	111	69	0.25	NA	NA	2.25	NA	NA	36	NA	NA	NA	NA
Percentile 10	NA	2.6	241	7.9	437	69	95	50	0.20	NA	NA	0.87	NA	NA	30	NA	NA	NA	NA
Percentile 90	NA	9.5	279	8.2	520	104	128	88	0.33	NA	NA	3.77	NA	NA	54	NA	NA	NA	NA

Legend:

NA: Not Applicable; no data or insufficient data available

T: Temperature (Celsius)
Turb: Turbidity (ntu)
TDS: Total Dissolved Solids (mg/L)
pH: Hydrogen ion concentration as minus $\log_{10}[H+]$
Spec EC: Specific Electric Conductance (umhos/cm)

Alk: Alkalinity (mg/L as CaC03)
Hard: Hardness (mg/L as CaC03)
Cl: Chloride (mg/L)
Br: Bromide (mg/L)
TOC: Total Organic Carbon (mg/L)

NO_2: Nitrite (mg/L as N)
NO_3: Nitrate (mg/L)
N: Total Nitrogen (ug/L as N)
PO_4: Phosphate (mg/L)
SO_4: Sulfate (mg/L)

Colif: Total Coliform (MPN/100mL)
E.Coli: Escherichia coli(MPN/100 mL)
Crypto: Cryptosporidium (#Oocysts/L)
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