Middle Santa Ana River TMDL
Phase I - Data Collection Effort

October 2005

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Additionally, the Middle Santa Ana River Pathogen TMDL workgroup would like to acknowledge that the preparation of this final report relied heavily on the efforts of the Santa Ana Regional Water Quality Control Board (Regional Board) and Wildermuth Environmental Incorporated (WEI).

Sections II and III describing the watershed reaches, as well as, the analysis of Water Quality Monitoring data was adapted from the Regional Board's Middle Santa Ana Pathogen TMDL report, *Staff Report on Bacterial Indicator Total Maximum Daily Loads in the Middle Santa Ana River Watershed*.

Section IV describing the Santa Ana River Beneficial Use Survey (SARBUS) was adapted from the WEI's, *Santa Ana River Beneficial Use Survey (SARBUS) Final report (November 2004 – August 2005).*

Project Summary

In August 2001, the Santa Ana Regional Water Quality Control Board (RWQCB) initiated a Total Maximum Daily Load (TMDL) development effort to address the excess levels of pollutants in these waterbodies. This effort included the formation of the Middle Santa Ana River TMDL Workgroup, a local stakeholder group interested in water quality issues impacting the watershed. This workgroup, which includes representatives from local cities, Riverside and San Bernardino Counties, agriculture and dairy, environmental groups is working in cooperation with Regional Board staff to assess pathogen sources and impacts on impaired waterbodies. The objectives of the workgroup efforts described in this report include the development and implementation of a water quality monitoring program to evaluate in-stream "pathogen indicator" concentrations. In addition, a field survey to evaluate the extent, frequency, and degree to which these waterbodies are used by the public for recreational activities (REC1 and REC2).

The Santa Ana River and its tributaries drain the southern portions of the San Gabriel Mountains and the San Bernardino Mountains. Together these waterbodies convey the largest volume of water among all rivers in southern California. The Middle Santa Ana River Watershed covers approximately 488 square miles and lies largely in the southwestern corner of San Bernardino County and the northwestern corner of Riverside County. A small part of Los Angeles County (Pomona/Claremont area) is also included.

Beginning in February 2002, the Workgroup developed and implemented an extensive pathogen water quality monitoring program. Samples were collected by Regional Board staff and stakeholder agencies at 10-13 locations on weekly basis during nine 30-day sampling periods. These sampling periods occurred during February, March, July and September of 2002, January and March of 2003, and from January through mid-April 2004. Agencies participating in the monitoring program included San Bernardino County Flood Control District (SBCFCD), City of Riverside, Orange County Water District (OCWD), Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM). Results of this program verified significant impairments to the identified water bodies and established the basis of the Regional Board TMDL report.

The TMDL Workgroup also conducted a beneficial use survey of the watershed as part of the data collection effort to support the development of TMDLs for the Middle Santa Ana River Watershed. The primary objective of this effort was to collect data to evaluate the extent, frequency, and degree to which the Santa Ana River channel and its Chino Basin tributaries are used by the public for recreational activities (REC1 and REC2).

The Santa Ana River Beneficial Use Survey (SARBUS) consisted of scheduled site visits to ten locations along the Santa Ana River channel and its Chino Basin tributaries thought to represent popular areas for the public to recreate. This included sites thought to be popular based upon access to the river channel, presence of a beach area, fishing and available parking. The field survey included a total of 62 events conducted between November 2004 and the end of August 2005. Results of the survey showed that both adults and children came to the river to swim, wade and recreate on-shore. In general, visitation was higher on weekends and during warmer weather. There was very little visitation during the colder, wet months. The ease with which a site may be reached appears to influence the amount of visitation to the location.

I. Introduction

Under Section 303(d) of the Clean Water Act, the Regional Water Quality Control Board (Regional Board) is required to identify surface waters that do not or are not expected to meet water quality standards (beneficial uses, water quality objectives) with the implementation of technology – based controls. Once a waterbody has been added to the 303(d) list of impaired waterbodies, a Total Maximum Daily Load (TMDL) must be developed for that waterbody and the pollutant causing impairment. A TMDL is established to address the pollutant causing impairment and thereby ensure that a waterbody will attain and maintain water quality standards, taking the existing pollutant loads and reasonably foreseeable increases in pollutant loads into consideration.

Several waterbodies in the Middle Santa Ana River Watershed have been included on the 303(d) list. These waterbodies include Reach 3 of the Santa Ana River, Chino Creek Reaches 1 and 2, Cucamonga Creek, Mill Creek in Prado Area, and Prado Park Lake. As specified in the 1995 Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), the beneficial uses of the Middle Santa Ana River water bodies included on the 303(d) list are shown in Table 1 below.

Table 1 Beneficial Uses and Impairments of Middle Santa Ana River 303(d)–Listed Waterbodies

Water Body	**Impairment**	**Beneficial Uses**
Santa Ana River Reach 3	nutrients, pathogens, salinity/TDS/chlorides	Agriculture (AGR), Groundwater Recharge (GWR), Body Contact Recreation (REC1), Non–Body Contact Recreation (REC2), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Rare Species Habitat (RARE)
Chino Creek Reach 1	nutrients, pathogens, high coliform count	REC1, REC2, WARM, WILD, RARE
Chino Creek Reach 2	nutrients, pathogens, high coliform count	REC1, REC2, Limited Warm Freshwater Habitat (LWRM), WILD
Mill Creek Prado Reach	nutrients, pathogens, suspended solids	REC1, REC2, WARM, WILD, RARE
Prado Park Lake	nutrients and pathogens	REC1, REC2, WARM, WILD, RARE
Cucamonga Creek Reach 1	high coliform count	GWR, REC1, REC2, LWRM, WILD

The Middle Santa Ana River waterbodies listed above are considered to be impaired due to high densities of bacterial indicators. With respect to bacterial contamination, body contact recreation (REC1) is the most sensitive beneficial use of the Middle Santa Ana River watershed waterbodies identified herein.

Bacterial indicators, in and of, themselves are not necessarily harmful to public health. However, densities of bacterial indicators above certain levels indicate that there may be other organisms present that are harmful to public health. Such pathogens include viruses, bacteria and protozoa. The use of bacterial indicators to indicate the presence of pathogens and the potential for waterborne infectious disease is well established. It is based on the inherent difficulties in direct pathogen measurements due to the lack of readily available and affordable analytical methods and the variety of pathogens that may be present.

The primary bacterial indicator that has been used for several decades is fecal coliform. Fecal coliform is a general category of bacteria that includes the genera *Enterobacter*, *Klebsiella*, *Citrobacter*, and *Escherichia*. These genera have usually represented the majority of analytical isolations made from raw and treated municipal water supplies.

For inland surface waters designated as REC1, the Basin Plan specifies the following water quality objectives:

> **Fecal coliform**: log mean less than 200 organisms/100 mL based on five or more samples per 30 day period, and not more than 10% of the samples exceed the single sample maximum of 400 organisms/100 mL for any 30–day period.

For inland surface waters designated as REC2, the Basin Plan specifies the following water quality objectives:

> **Fecal coliform:** average less than 2000 organisms/100 mL and not more than 10% of samples exceed the single sample maximum of 4000 organisms/100 mL for any 30–day period.

These objectives apply to inland surface waters within the Region throughout the year. The Basin Plan does not distinguish fecal coliform objectives based on season, the presence of storm flows or other waterbody characteristics that may affect actual recreational uses of the waterbodies.

In August 2001, the Santa Ana Regional Water Quality Control Board (RWQCB) initiated a Total Maximum Daily Load (TMDL) development effort to address the excess levels of pollutants in these waterbodies. This effort included the formation of the Middle Santa Ana River TMDL Workgroup, a local stakeholder group interested in water quality issues impacting the watershed. Appendix A includes meeting notes from all of the Middle Santa Ana River Pathogen TMDL workgroup meetings held during the duration of this study. This workgroup, which includes representatives from local cities, Riverside and San Bernardino Counties, agriculture and dairy, environmental groups is working in cooperation with Regional Board staff to assess pathogen sources and impacts on impaired waterbodies. Agencies and organizations participating in this workgroup are listed in Table 2.

Table 2 Middle Santa Ana River TMDL Workgroup Participating Members

Water and Wastewater Agencies
Chino Basin Water Conservation District
Chino Basin Watermaster
Cucamonga Valley Water District
Fontana Union Water Company
Fontana Water Company
Inland Empire Utilities Agency
Jurupa Community Service District
Monte Vista Water District
Orange County Sanitation District
Orange County Water District
Riverside - Highland Water Company
Three Valleys Municipal Water District
Santa Ana Watershed Project Authority
Los Angeles County Department of Public Works
Orange County Sanitation District

County Agencies
County of Orange
Riverside County Farm Bureau
Riverside County Flood Control & Water Conservation District
County of San Bernardino Flood Control District

Other Organizations
Inland Empire West Resource Conservation District
Milk Producers Council

Federal Agencies
San Bernardino National Forest
U. S. Army Corps of Engineers
U. S. Fish & Wildlife Services
U. S. Geological Survey

State Agencies
California Department of Fish & Game
California Department of Water Resources
California Milk Producers Council
Santa Ana Regional Water Quality Control Board

Cities
City of Chino
City of Chino Hills
City of Claremont
City of Corona
City of Fontana
City of Montclair
City of Norco
City of Ontario
City of Pomona
City of Rancho Cucamonga
City of Riverside
City of San Bernardino
City of Upland

The objectives of the workgroup efforts described in this report include the development and implementation of:

1. A water quality monitoring program to evaluate in-stream "pathogen indicator" concentrations and
2. A field survey to evaluate the extent, frequency, and degree to which these waterbodies are used by the public for recreational activities (REC1 and REC2).

II. The Watershed

The Santa Ana River and its tributaries drain the southern portions of the San Gabriel Mountains and the San Bernardino Mountains. Together these waterbodies convey the largest volume of water among all rivers in southern California. As shown in Figure 1, the Middle Santa Ana River Watershed covers approximately 488 square miles and lies largely in the southwestern corner of San Bernardino County and the northwestern corner of Riverside County. A small part of Los Angeles County (Pomona/Claremont area) is also included. This watershed is comprised of three sub-watersheds. The first sub-watershed is the Chino Basin Watershed, which includes portions of San Bernardino County, Los Angeles County, and Riverside County. Surface drainage in this area is directed to Chino Creek and Cucamonga/Mill Creek in a generally southward direction, from the San Gabriel Mountains toward the Santa Ana River and the Prado Flood Control Basin. Prado Park Lake is located in the Prado Basin. The second sub-watershed is generally westward from the City of Riverside to the Santa Ana River, Reach 3. The third sub-watershed is the Temescal Canyon Watershed, which is also located in Riverside County. Surface drainage in this area is generally northward to Temescal Creek and then to the Santa Ana River just upstream of Prado Dam.

The following is a description of the waterbodies included on the 303(d) list for bacterial indicators that are addressed by the proposed TMDL.

Santa Ana River, Reach 3

Reach 3, as identified in Figure 1, is that portion of the river that extends upstream from Prado Dam to the Mission Boulevard Bridge in Riverside. Reach 3 was placed on the 303(d) list in 1988, however, only the lower segment of Reach 3 (behind Prado Dam) was designated as impaired. After TMDL development activities commenced and monitoring results were generated, the TMDL effort was expanded to include all of Reach 3 because monitoring results indicated that other areas of Reach 3 experienced elevated bacteria levels as well. Reach 3 generally flows from east to west and has a natural, unlined bottom, throughout most of its length, as shown in Photos 1 thru 4, there is an approximately 3.5 mile stretch of the upper segment that has been straightened and has rip-rapped banks.

Baseflow in the Santa Ana River, Reach 3 consists of nuisance runoff, rising groundwater, and discharges from several Publicly Owned Treatment Works (POTWs) that occur in Reach 3 or upstream Reaches. These POTW discharges include those from the City of Rialto, Rapid Infiltration and Extraction Facility (RIX) for the cities of Colton and San Bernardino, City of Riverside Water Quality Control Plant, Western Riverside Regional Wastewater Treatment Plant and the City of Corona Municipal Wastewater Treatment Plant described in Appendix B.

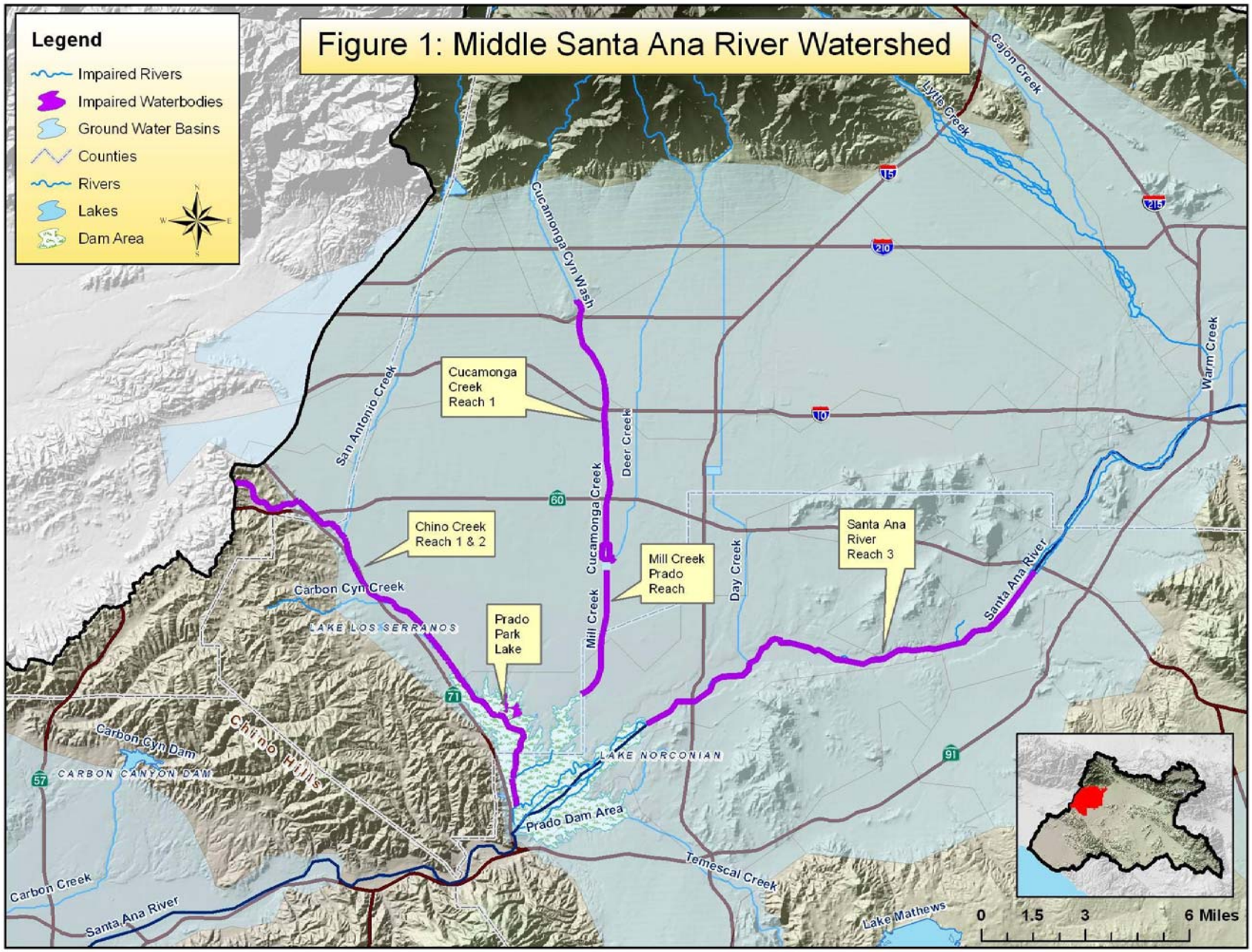

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Photo 1: Santa Ana River – Reach 3 at Mission Boulevard overpass, looking south downstream.

Photo 2: Santa Ana River – Reach 3, MWD Crossing (TMDL sampling location S1), looking north.

Photo 3: Santa Ana River – Reach 3 at Van Buren Avenue overpass, looking northwest.

Photo 4: Santa Ana River – Reach 3 at Prado Basin Park near River Road crossing, looking upstream (east).

Chino Creek, Reaches 1 and 2

Chino Creek is a tributary of the Santa Ana River, Reach 3. It extends from its confluence with the Santa Ana River (directly behind Prado Dam) along the eastern base of the Chino Hills and into southern Pomona.

Chino Creek is divided into two reaches. As identified in Figure 1, Reach 1[1] is that portion of the creek that extends from the confluence with the Santa Ana River upstream to the beginning of the concrete-lined channel south of Los Serranos Rd. Reach 1 flows from north to south, and except for a short segment in the upper portion of the reach, has natural unlined bottom and banks. While this short upper segment is not concrete-lined, it is not in a natural state. The channel in this portion of the creek has been engineered into a straightened configuration, and rip-rap materials and boulders have been placed along the banks in places (See Photos 5, 6 and 7). Chino Creek, Reach 1 was added to the 303(d) list in 1994.

Chino Creek, Reach 2, as identified in Figure 1, extends from Los Serranos Rd. to the boundary of Region 8 with that of the Los Angeles Regional Water Quality Control Board (Region 4) at the Los Angeles/San Bernardino County line. This Reach of Chino Creek flows in a northwest to southeast orientation, and, as shown in Photo 8, is concrete-lined along the bottom and banks throughout its length. San Antonio Creek, an important drainage feature in western Chino Basin, is tributary to Chino Creek, Reach 2 at a location just north of Chino Avenue. Chino Creek, Reach 2 was added to the 303(d) list in 1998.

Baseflow in Chino Creek consists primarily of wastewater effluent discharges from Inland Empire Utilities Agency's (IEUA) POTWs, Carbon Canyon and RP-5, and nuisance runoff.

[1] A Basin Plan amendment adopted by the Santa Ana Regional water Quality Control Board on January 24, 2004, and awaiting approval by the State of California and U.S. Environmental Protection Agency includes the subdivision of Reach 1 of Chino Creek into two reaches, 1A and 1B. Reach 1A extends from the Santa Ana River confluence to downstream of the confluence with Mill Creek. Reach 1B extends from the confluence of Mill Creek to the beginning of the concrete-lined channel south of Los Serranos Road. The confluence of Mill Creek is in Chino Creek, Reach 1B. Approval of this amendment will not result in a material difference in the proposed TMDL.

Photo 5: Chino Creek transition of Reach 2 to Reach 1B, at Central Avenue overpass, looking northwest.

Photo 6: Chino Creek – Reach 1, at Central Avenue (TMDL sampling location C7), looking downstream (south).

Photo 7 Chino Creek – Reach 1, in Prado Basin near Prado Wetlands (TMDL sampling location C6), looking upstream (north).

Photo 8: Chino Creek – Reach 2 (confluence of Chino Creek (on left and foreground) with San Antonio Channel (on back right)) at Chino Avenue, looking north.

Mill Creek, Prado Area

As identified in Figure 1, Mill Creek is a tributary to Chino Creek, Reach 1 in the lower part of Prado Basin. Mill Creek extends from its confluence with Chino Creek to a location just upstream of Chino-Corona Road near the San Bernardino/Riverside County border. Upstream of this location, the creek is concrete-lined and is designated as a natural unlined bottom and banks

(see Photos 9 and 10). Baseflow in Mill Creek consists primarily of wastewater effluent from IEUA's RP-1, and nuisance runoff. Mill Creek, Prado Area was added to the 303(d) list in 1994.

Photo 9: Mill Creek, Prado Area at Chino–Corona Rd overpass (TMDL sampling location M5), looking downstream (southwest).

Photo 10: Mill Creek, Prado Area at Chino–Corona Rd overpass (TMDL sampling location M5), looking downstream (south).

Cucamonga Creek, Reach 1

As identified in Figure 1, Cucamonga Creek is located just upstream of Chino – Corona Road and is designated like Mill Creek as a natural unlined bottom and banks. Cucamonga Creek, Reach 1 extends from this "confluence" to the point where 23rd Street crosses the channel in the city of Upland. The segment of Cucamonga Creek upstream of this location is designated as

Reach 2. Cucamonga Creek, Reach 1 flows from north to south, across the central part of the Chino Basin area, and, as shown in Photos 11 an 12, is concrete-lined along the bottom and banks throughout its length. As with Mill Creek, Prado Area, baseflow in Cucamonga Creek consists primarily of effluent from IEUA RP-1, and nuisance runoff. Cucamonga Creek, Reach 1 was added to the 303(d) list in 1998.

Photo 11: Cucamonga Creek – Valley Reach at IEUA's RP–1 (TMDL sampling location M2), looking upstream (north).

Photo 12: Cucamonga Creek, Valley Reach (transition to Mill Creek) at Hellman Avenue, looking downstream (southwest)

Prado Park Lake

As identified in Figure 1, Prado Park Lake is a 60-acre, man-made lake located within the 2000-acre Prado Park, in the southern part of Chino Basin near the junction of Highway 83 (Euclid Avenue) and State Highway 7. Water levels in Prado Park Lake are maintained through discharges of recycled water from IEUA's Regional Plant No. 1. Approximately 8 million gallons per day (MGD) of recycled water are discharged to the lake by IEUA. This recycled water flows out of the lake through its outlet structure (see Photo 13), and, after a short distance, flows into Chino Creek, Reach 1. The lake supports fishing activities, human-powered boating, and wildlife (see Photo 14).

Prado Park Lake is actually situated at the confluence of two drainage channels – the Euclid Avenue storm channel and the Grove Avenue storm channel. During low-flow conditions, urban runoff from these two channels flows under the lake through pipes and discharges into the lake's outlet structure (see Photo 13). However, these pipes are undersized and, during large storm events, they cannot handle the storm flows. Consequently, storm water is discharged directly into the lake. In 1991 and in 1998, nutrient rich storm water entered the lake, which resulted in suppressed dissolved oxygen levels and fish kills. In such situations, the lake has to be completely drained, and the fish and residual contaminant materials removed. Prado Park Lake was placed on the 303(d) list in 1994 due to elevated nutrient levels as a result of the 1991 fish kill incident; elevated bacteria levels were also identified as a source of impairment based on best professional judgment. Follow-up sampling in 1998 confirmed high bacterial indicator levels.

Photo 13: Prado Park Lake outlet structure (TMDL sampling location C3), looking east

Photo 14: Prado Park Lake, looking south

III. Water Quality Monitoring Program

The Workgroup developed and implemented an extensive monitoring program in February 2002. Water samples were collected by Regional Board staff and stakeholder agency staff at 10 – 13 locations on a weekly basis during nine 30-day sampling periods. Agencies participating in the monitoring program included San Bernardino County Flood Control District (SBCFCD), City of Riverside, Orange County Water District (OCWD), Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM). Sampling locations listed in Table 3 are shown in Figure 2. The 30-day sampling periods occurred during February, March, July and September of 2002, January and March of 2003, and from January through mid-April 2004. Samples were analyzed for bacterial indicators, including fecal coliform, total coliform, e. coli, and enterococcus[2] following monitoring protocol identified in the Quality Assurance Project Plan for Chino Basin TMDL Bacteria Monitoring included as Appendix C. Laboratory analysis of the water quality samples was performed by Orange County Health Care Agency (OCHCA). The primary purpose for sampling "30-day periods" rather than year round was to collect data to represent the two predominant seasons, wet and dry experienced in the region. This included sampling at different times of the year – under dry season/baseflow conditions as well as during storm events. However, the past 2 years have been extremely dry; therefore, none of the data that was collected represents bacterial levels during storm events.

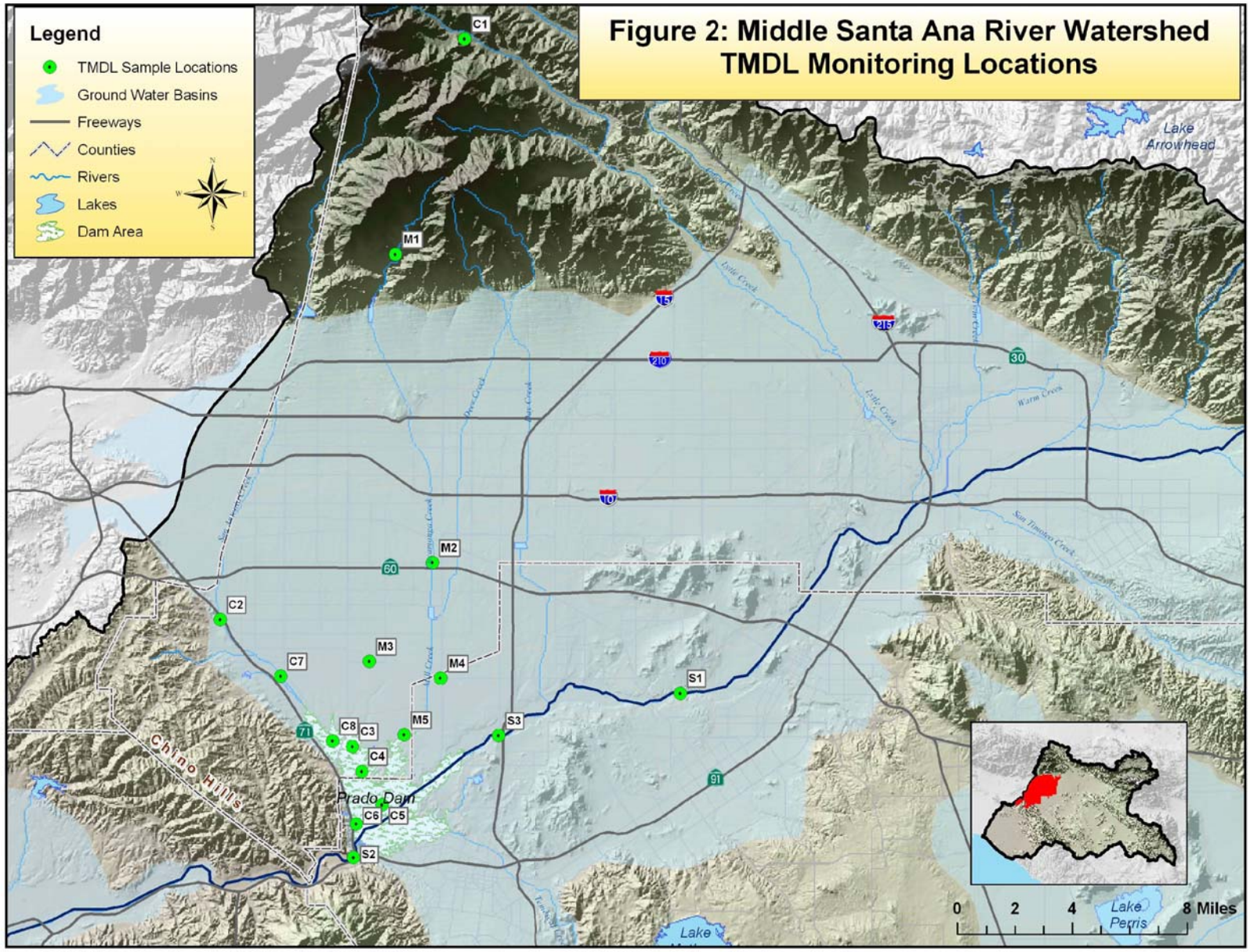
Results of bacterial indicator monitoring performed in 2002-2004 are provided in Appendix D. Daily flow data for the sampling days at selected sampling locations (where USGS gauging stations exist) are also provided. As indicated in Table 3, monitoring stations were sited at locations of potential sources of bacteria input based on representative land uses, and also at locations within the 303(d) listed waterbodies to more fully evaluate the degree of impairment under various hydrological regimes. As indicated previously, the bulk of the data that were used to support adding the waterbodies to the 303(d) list was collected during rainfall events. The monitoring program implemented beginning in February 2002 attempted to confirm the stromwater results as well as to determine bacterial loadings during low-flow conditions; however, as discussed above, no storm event data were collected during 2002-2004. An analysis of the results of this monitoring effort is provided below.

[2] As previously discussed, USEPA expects all states to adopt objectives based on E. *coli* and/or enterococci as microbial water quality indicators. Some other Regional Water Quality Control Boards within the State of California have adopted these indicators into their Basin Plans. The Santa Ana Regional Water Quality Control Board is currently evaluating them for use within the Santa Ana Watershed. For the TMDL monitoring program, samples were analyzed for E. *coli* and enterococci, anticipating possible future adoption of objectives based on these indicators.

Table 3 Middle Santa Ana River Watershed Bacterial Indicator TMDL Sampling Locations

Site ID	LOCATION	REASON FOR SAMPLING
C1	Icehouse Canyon Creek	Open Space Evaluation
C2	Chino Creek @ Schaeffer Ave	Urban Runoff Evaluation
C3	Prado Park Lake Outlet Structure	Impairment Status
C4	Chino Creek @ Prado Wetlands	Impairment Status
C5	Prado Wetlands Effluent	Evaluate Contribution
C6	Chino Creek Downstream of Wetlands	Impairment Status
C7	Chino Creek @ Central Ave	Impairment Status
C8	Chino Creek @ Prado Golf Course	Impairment Status
M1	Cucamonga Creek @ CCWD Ponds	Open Space Evaluation
M2	Cucamonga Creek. @ IEUA's Regional Plant No. 1	Urban Runoff Evaluation
M3	*Bon View Ave @ Merrill (NW Corner)	Agric. Runoff Evaluation
M4	*Archibald Ave @ Cloverdale Ave	Agric. Runoff Evaluation
M5	Mill Creek @ Chino–Corona Rd.	Impairment Status
S1	Santa Ana River @ MWD Crossing	Impairment Status
S2	Santa Ana River @ Prado Dam	Impairment Status
S3	Santa Ana River @ Hamner Ave	Impairment Status

* These sampling locations are actually large street gutters that are tributary to Chino Creek Reach 1 and the Santa Ana River Reach 3, respectively.



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Monitoring Program Results

Monitoring program results are presented in Tables 4, 5 and 6. Note that the reporting unit for these analyses is colony forming units/100 mL (CFU). CFU are the reporting units for the membrane filtration test method, which is one of the two primary test methods for bacterial indicators. As mentioned earlier, the other test method (multi-tube fermentation) provides results in terms of most probable number. Results from the two tests are roughly, though not exactly, equivalent. Either method provides adequate information for comparison to the Regional Board's bacterial indicator Basin Plan objective for REC1 beneficial uses.

Table 4 Logarithmic Means (CFU/100ml) for Fecal Coliform at Sampling Locations in Middle Santa Ana River Watershed, February 2002 to March 2004

Site ID	Sampling Site	Feb 2002	Mar 2002	Jul 2002	Sep 2002	Jan 2003	Mar 2003	Jan 2004	Feb 2004	Mar 2004
C1	Icehouse Canyon Creek	10	10	41	270	10	10	16	11	9
C2	Chino Creek @ Schaeffer Ave.	3,400	870	2,000	340	850	1,200	220	180	83
C3	Prado Park Lake	290	220	120	410	270	480	110	80	21
C4	Chino Creek Above Wetlands	280	200	160	620	270	760	NAS	NAS	NAS
C5	Wetlands Effluent	160	210	880	1,400	420	200	NAS	NAS	NAS
C6	Chino Creek Below Wetlands	NS	110	630	560	140	NS	NAS	NAS	NAS
C7	Chino Creek @ Central Ave.	NAS	NAS	NAS	NAS	NAS	NAS	150	120	200
C8	Chino Creek @ Prado GC	NAS	NAS	NAS	NAS	NAS	NAS	420	640	290
M1	Cucamonga Creek @ CCWD Ponds	10	10	25	19	10	11	9	9	9
M2	Cucamonga Creek @ RP–1	5,800	3,400	18,000	9,100	6,400	130	2,300	270	360
M3	Bon View Ave. @ Merrill Ave.	7,400	29,000	NS	NS	NS	NS	NS	NS	NS
M4	Archibald Ave. @ Cloverdale Ave.	NS	NS	NS	NS	NS	NS	NS	NS	NS
M5	Mill Creek @ Chino–Corona Road	320	140	1,200	1,300	410	880	360	210	120
S1	Santa Ana River @ MWD Crossing	90	180	290	450	180	180	180	290	110
S2	Santa Ana River Below Prado Dam	110	250	530	370	54	110	40	55	25
S3	Santa Ana River @ Hamner Ave.	NAS	NAS	NAS	NAS	NAS	NAS	200	330	110

Highlight number indicates that logarithmic mean exceeds water quality objective of 200 organisms/100 mL in a 30 day period (see Section 2.5) (# of organisms is equivalent to CFUs).

CFU = Colony Forming Units

NAS = Sampling location was not part of the monitoring program during the sampling period.

NS = No samples were collected at the sampling location during the sampling period or an insufficient number of samples were collected to generate a logarithmic mean.

The sampling data were compared to the current fecal coliform Basin Plan objective, both the 30-day logarithmic mean and the single sample maximum, and exceedances of these objectives were noted. The data were also compared to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Water Resources Control Board, 2004) (303(d) Listing Policy). The 303(d) Listing Policy, adopted by the State Water Resources Control Board (State Board) in August 2004, specifies the minimum number of measured exceedances required to place a water segment on the 303(d) list of impaired waterbodies. This evaluation indicates whether specific waterbodies would now be placed on the 303(d) list pursuant to the Listing Policy. Based upon this evaluation, all of the subject waterbodies would still have been placed on the 303(d) list.

Table 5 Analysis of Logarithmic Means from Bacterial Indicator TMDL Monitoring Program

Site ID	Sampling Site	Number of Logarithmic Means	Number of Logarithmic Means Greater Than 200 CFU/100ml	Percentage of Logarithmic Means Greater Than 200 CFU/100ml
C1	Icehouse Canyon Creek	9	1	11%
C2	Chino Creek @ Schaeffer Ave.	9	7*	78%
C3	Prado Park Lake	9	5*	56%
C4	Chino Creek Above Wetlands	6	5*	83%
C5	Wetlands Effluent	6	5*	83%
C6	Chino Creek Below Wetlands	4**	2	50%
C7	Chino Creek @ Central Ave.	3	1	33%
C8	Chino Creek @ Prado GC	3	3	100%
M1	Cucamonga Creek @ CCWD Ponds	9	0	0%
M2	Cucamonga Creek @ RP–1	9	8*	89%
M3	Bon View Ave. @ Merrill Ave.	2**	2	100%
M4	Archibald Ave. @ Cloverdale Ave.	0**	NA	NA
M5	Mill Creek @ Chino–Corona Road	9	7*	78%
S1	Santa Ana River @ MWD Crossing	9	3	33%
S2	Santa Ana River Below Prado Dam	9	3	33%
S3	Santa Ana River @ Hamner Ave.	3**	2	67%

CFU = Colony Forming Units

NA = Not applicable because an insufficient number of samples were collected at the sampling site to generate logarithmic means.

* Equals or exceeds State Water Resources Control Board 303(d) Listing Policy Criteria

** sites with insufficient samples to compare to Listing Policy Criteria

Table 6 Summary of Individual Sampling Events from Bacterial Indicator TMDL Monitoring Program

Site ID	Sampling Site	Total Number of Samples	Number of Samples w/Densities Greater than 400 CFU/100 ml	Percentage of Samples w/Densities Greater than 400 CFU/100 ml
C1	Icehouse Canyon Creek	43	1	2%
C2	Chino Creek @ Schaeffer Ave.	45	27*	60%
C3	Prado Park Lake	42	5*	12%
C4	Chino Creek Above Wetlands	30	9*	30%
C5	Wetlands Effluent	30	16*	53%
C6	Chino Creek Below Wetlands	17	11*	65%
C7	Chino Creek @ Central Ave.	15	1	7%
C8	Chino Creek @ Prado GC	15	9*	60%
M1	Cucamonga Creek @ CCWD Ponds	44	0	0%
M2	Cucamonga Creek @ RP–1	45	36*	80%
M3	Bon View Ave. @ Merrill Ave.	13	13	100%
M4	Archibald Ave. @ Cloverdale Ave.	0**	0	0%
M5	Mill Creek @ Chino–Corona Road	45	21*	47%
S1	Santa Ana River @ MWD Crossing	44	8*	18%
S2	Santa Ana River Below Prado Dam	45	14*	31%
S3	Santa Ana River @ Hamner Ave.	15	2	13%

* Equals or exceeds State Water Resources Control Board 303(d) Listing Policy Criteria
** site with insufficient samples to compare to Listing Policy Criteria

Santa Ana River, Reach 3

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target) –

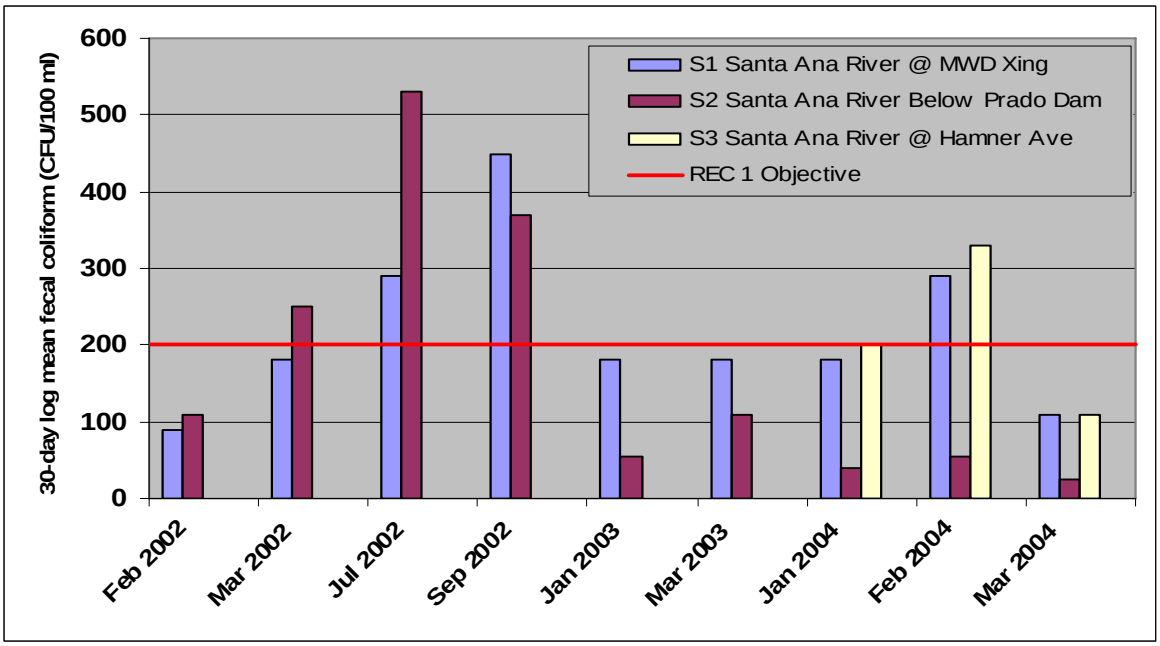
To evaluate Santa Ana River, Reach 3, samples were collected at two sites during 2002 – 2004: MWD Crossing (S1), where the Metropolitan Water District of Southern California (MWD) pipeline crosses the Santa Ana River in Riverside, and the United States Geological Survey gauging station (USGS Station) located just downstream of Prado Dam (S2). A third location, where Hamner Avenue crosses the river (S3), was added in 2004 to provide information on the long segment of the river between the other two points. A sufficient number of samples were collected at MWD Crossing and at the USGS Station to generate fecal coliform logarithmic means for nine 30-day periods at each location. Logarithmic means were generated for three 30-day periods at location Hamner Avenue (S3).

As shown in Table 5 and in Figure 3, the logarithmic means at MWD Crossing and at the USGS Station exceeded the water quality objective three of the nine 30-day periods, with two of these three sampling periods occurring during summer months (July and September 2002) when people are more likely to use the river for recreational activities. In addition, individual samples at MWD Crossing exceeded the single sample maximum of 400 CFU/100 mL 8 of 144 times (18%), while individual samples at the USGS Gauging Station exceeded the single sample maximum 14 of 45 times (31%) (see Table 6). The logarithmic means at Hamner Avenue exceeded the water quality objective two of the three 30-day periods, while individual samples at Hamner Avenue exceeded the single sample maximum 2 of 15 times (13%). The logarithmic means at MWD Crossing and at the USGS Station exceeded the water quality objective during both summer season 30-day periods. These results indicate impairment due to bacterial contamination during critical times when REC1 uses are likely to be the greatest. During a majority of the sampling periods, bacterial indicator concentrations were generally in compliance during the winter months (again, because the 2002 – 2004 winter periods were relatively dry, the winter month data does not represent fecal coliform densities during storm events).

Comparison with the SWRCB's 303(d) Listing Policy Criteria –

As shown in Table 5, based on 30-day logarithmic mean fecal coliform data, none of the Santa Ana River, Reach 3 sampling locations had the minimum number of exceedances for listing a waterbody on the 303(d) list pursuant to the 303(d) Listing Policy. However, based on the single sample sampling results (see Table 6), the Santa Ana River at MWD Crossing and the Santa Ana River below Prado Dam exceed the minimum number of exceedances for listing a waterbody on the 303(d) list. Therefore, the 2002 – 2004 fecal coliform data does point to fecal coliform impairment of the Santa Ana River, Reach 3.

Figure 3 30-day Fecal Coliform Logarithmic Mean Densities for Bacterial Indicator TMDL Monitoring of Santa Ana River, Reach 3



Chino Creek, Reach 1 and Reach 2

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target)

Monitoring locations along Chino Creek, as shown in Tables 4 and 6, were not sampled during each of the nine 30-day sampling periods from 2002-2004. Samples were collected during all nine 30-day sampling periods only at the Schaeffer Avenue site (C2) in Reach 2 of the Creek, where the United States Geological Survey operates a stream gauging station. The Reach 1 site (C4), located at Orange County Water District's Prado Wetlands just upstream of the point where the wetlands discharge into Chino Creek, was sampled during 2002 and 2003, as was the Prado Wetlands discharge to the Creek (C5). Chino Creek downstream of where the Prado Wetlands discharge to Chino Creek (C6) was sampled 3 times during 2002 and once in 2003 to assess the effect of the wetlands inflows on the quality of the Creek. At the Chino Creek downstream of the Prado Wetlands discharge (C6), a sufficient number of samples were collected to generate logarithmic means only during four 30-day periods. Finally, two additional Reach 1 locations at Central Avenue (C7) and at the Prado Golf Course (C8) just upstream of Euclid Avenue were added in 2004 to provide information on the Chino Creek between the other two points. Nine logarithmic means were generated for the Schaeffer Avenue location (C2), six logarithmic means were generated for the Prado Wetlands location and the wetlands effluent (C4 and C5, respectively), four logarithmic means were generated for the point downstream of the Prado Wetlands discharge (C6) and three logarithmic means each were generated for the Central Avenue (C7) and Prado Golf Course locations (C8).

As shown in Table 5 and Figure 4, at the Schaeffer Avenue location, logarithmic means exceeded the water quality objective seven of the nine 30-day periods, and, as shown in Table 6, individual samples at the Schaeffer Avenue location exceeded the single sample maximum 27 of

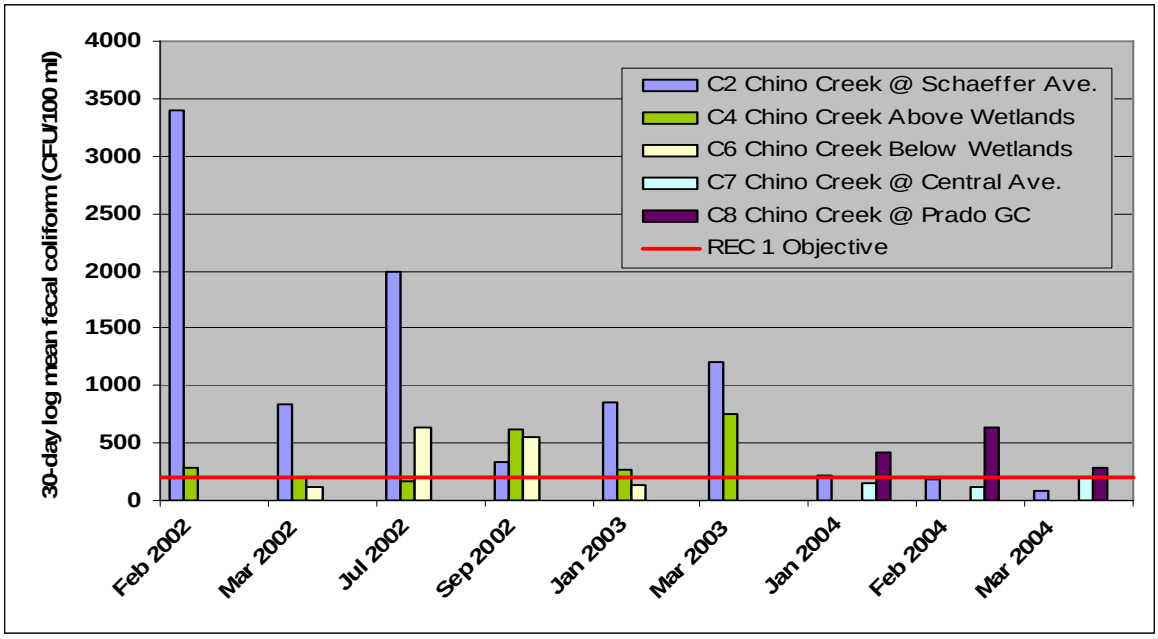
45 times (60%). At the point upstream of Prado Wetlands discharge location, the logarithmic means exceeded the water quality objective five of six 30-day periods, and individual samples at this location exceeded the single sample maximum 9 of 30 times (30%). At the point downstream of the Prado Wetlands discharge, the logarithmic means exceeded the water quality objective two of the four 30-day periods, and individual samples at this location exceeded the single sample maximum 11 of 17 times (65%). At the Central Avenue location, one of the three logarithmic means exceeded the water quality objective, and individual samples at the Central Avenue location exceeded the single sample maximum only 1 of 15 times (7%). At the Prado Golf Course location, logarithmic means exceeded the water quality objective for all three 30-day periods, and individual samples at the Prado Golf Course location exceeded the single sample maximum 9 of 15 times (60%).

Comparison with the SWRCB's 303(d) Listing Policy Criteria

As noted in Tables 4 and 6, most of the Chino Creek sampling locations exceed the 303(d) Listing Policy criteria for either the 30-day logarithmic means and/or the individual sample results.

It should be noted that for the Chino Creek downstream of Prado Wetlands sampling site and Chino Creek at Central Avenue, the sample size (<5) was insufficient to compare the 30-day logarithmic means to the 303(d) Listing Policy criteria. Comparison of the individual sampling results for these two sampling locations shows that only the Chino Creek at the Prado Golf Course exceeds the 303(d) Listing Policy criteria. This comparative analysis confirms that the 303(d) listing of Chino Creek is appropriate.

Figure 4 30-day Fecal Coliform Logarithmic Mean Densities for TMDL Monitoring of Chino Creek, Reaches 1 and 2



Mill Creek, Prado Area and Cucamonga Creek, Reach 1 (Valley Reach)

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target)

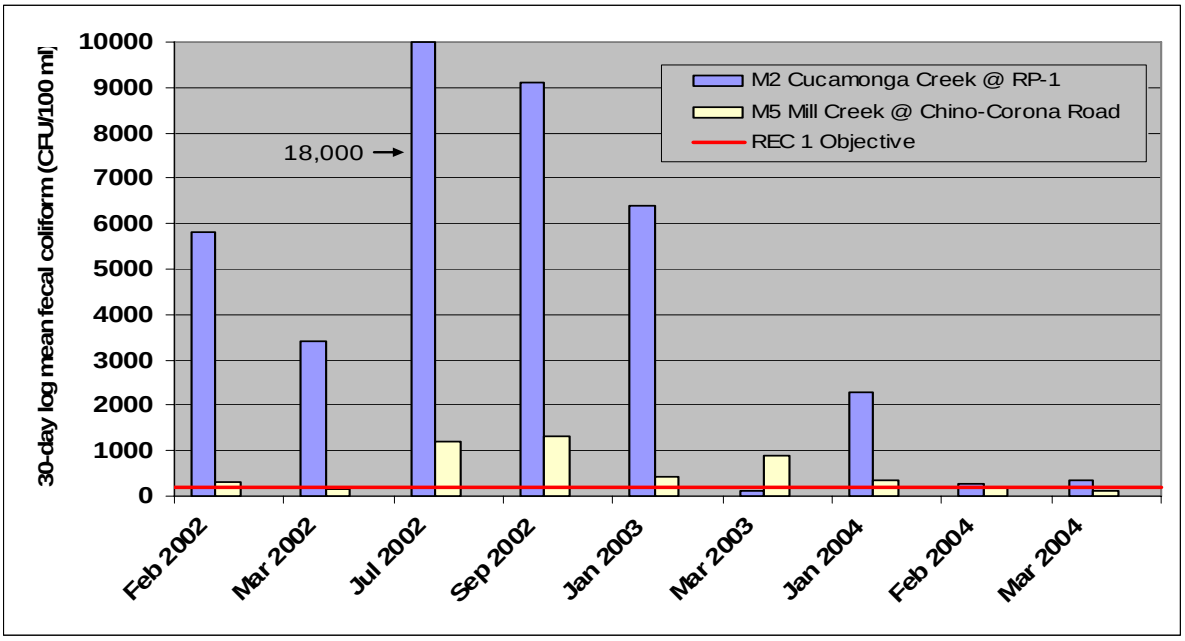
Mill Creek (Prado Area) and Cucamonga Creek, Reach 1 are evaluated together since Cucamonga Creek is directly tributary to Mill Creek and in fact are essentially the same waterbody. To evaluate Cucamonga/Mill Creek, samples were collected at two sites during all nine 30-day sampling periods (2002-2004). Cucamonga Creek was sampled upstream of Inland Empire Utilities Agency's Regional Plant No. 1 (RP-1) discharge point (M2). Mill Creek was sampled at the Chino-Corona Road crossing (M5). Nine logarithmic means were generated for each site. Because of the low flow conditions in these creeks during the TMDL sampling period, Bon View Avenue (M3) at Merrill Avenue only 13 samples were collected; at Archibald Avenue at Cloverdale Avenue (M4) no samples were collected.

As shown in Tables 5 and 6, at the RP-1 location, logarithmic means exceeded the water quality objective eight of the nine 30-day periods, and individual samples at RP-1 exceeded the single sample maximum 36 of 45 times (80%). At the Chino-Corona Road location, logarithmic means also exceeded the water quality objective eight of nine 30-day periods, and individual samples at the Chino-Corona Road location exceeded the single sample maximum 21 of 45 times (47%) (see Figure 5).

Comparison with the SWRCB's 303(d) Listing Policy Criteria

As shown in Tables 5 and 6, comparison of the results from Mill Creek and Cucamonga Creek to the 303(d) Listing Policy criteria confirms the impairment of these waterbodies. Both 30-day logarithmic means and the individual sample results for both sampling locations exceed the minimum number of exceedances for listing a waterbody on the 303(d) list.

Figure 5 30-day Fecal Coliform Logarithmic Mean Densities for TMDL Monitoring of Cucamonga Creek/Mill Creek



Prado Park Lake

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target) –

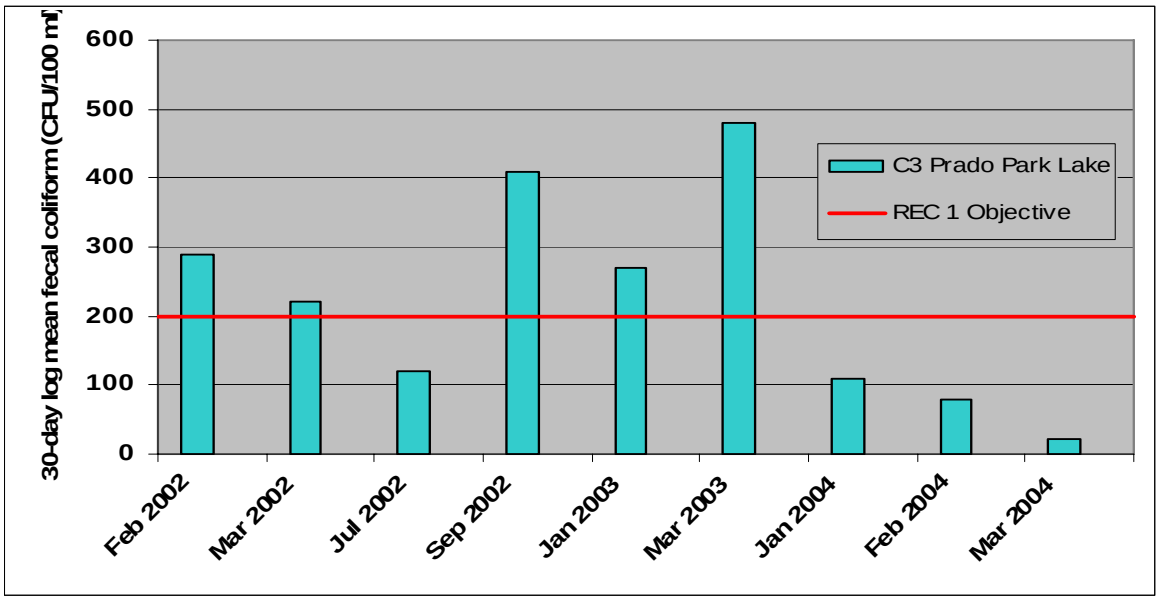
To evaluate water quality in Prado Park Lake, samples were collected at the lake's outlet structure (C3). Nine 30-day logarithmic means were generated for this location.

As shown in Figure 6, logarithmic means for Prado Park Lake exceeded the water quality objective five of nine 30-day periods, and individual samples at Prado Park Lake exceeded the single sample maximum 5 of 42 times (12%) (see Tables 5 and 6).

Comparison with the SWRCB's 303(d) Listing Policy Criteria –

As shown in Tables 5, and 6, comparison of the fecal coliform results for Prado Park Lake to the 303(d) Listing Policy criteria confirms the impairment of this waterbody. Both the 30-day logarithmic means and the individual sample results for both sampling locations exceed the minimum number of exceedances for listing a waterbody on the 303(d) list.

Figure 6 30-day Fecal Coliform Logarithmic Mean Densities for TMDL Monitoring of Prado Park Lake



Icehouse Canyon Creek

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target) –

Icehouse Canyon Creek is located in the San Gabriel Mountains and is tributary to San Antonio Creek approximately 1.3 miles upstream of Mt. Baldy Village. The sampling site for Icehouse Canyon Creek (C1) is located approximately ½ mile upstream of the point where it discharges into San Antonio Creek. Nine logarithmic means were generated for Icehouse Canyon Creek.

As shown in Figure 7, only one of the nine logarithmic means exceeded the water quality objective. During the one 30-day period when the Basin Plan fecal coliform water quality objective was exceeded, only four samples were collected, three of which were at or below the

water quality objective; however, the one remaining sample indicated bacteria levels 47 times greater than the water quality objective. This one sample significantly affected the logarithmic mean for that 30-day sampling period and is considered an aberration. Logarithmic means for the other eight 30-day periods were less than 20% of the water quality objective.

Comparison with the SWRCB's 303(d) Listing Policy Criteria

None of the 30-day logarithmic means or the individual sample results at Icehouse Canyon Creek exceeded the minimum number of exceedances for listing a waterbody on the 303(d) list (see Tables 5, and 6).

Cucamonga Creek, Mountain Reach at Cucamonga County Water District Ponds

Comparison of data to Basin Plan REC-1 fecal coliform water quality objective (proposed numeric target)

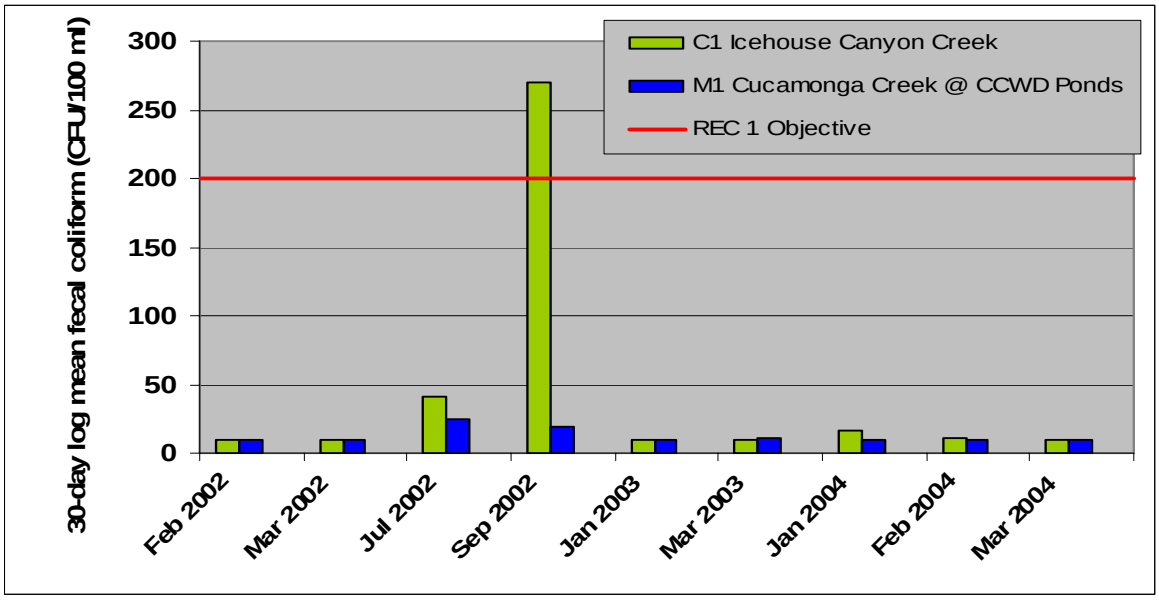
Cucamonga Creek, Mountain Reach begins in Cucamonga Canyon in the San Gabriel Mountains to the east of Icehouse Canyon. The sampling site for Cucamonga Creek, Mountain Reach (M1) is located immediately upstream of Cucamonga County Water District's recharge ponds, which are approximately 2.5 miles north of the 210 Freeway. Nine logarithmic means were generated for Cucamonga Creek, Mountain Reach.

As shown in Figure 7, of the nine 30-day logarithmic means, none exceeded the Basin Plan objective. In fact, all of the logarithmic means for Cucamonga Creek, Mountain Reach were less than 15% of the water quality objective, and none of the 44 individual samples at Cucamonga Creek, Mountain Reach exceeded the single sample maximum.

Comparison with the SWRCB's 303(d) Listing Policy Criteria

None of the nine 30-day logarithmic means or the individual sample results at Cucamonga Creek, Mountain Reach exceeded the minimum number of exceedances for listing a waterbody on the 303(d) list, pursuant to the Listing Policy (see Tables 5 and 6).

Figure 7 30-day Fecal Coliform Logarithmic Mean Densities for TMDL Monitoring of Icehouse Canyon Creek and Cucamonga Creek, Mountain Reach



IV. Beneficial Use Survey

The TMDL Workgroup also conducted a beneficial use survey of the watershed as part of the data collection effort to support the development of TMDLs for the Middle Santa Ana River Watershed. The primary objective of this effort was to collect data to evaluate the extent, frequency, and degree to which the Santa Ana River channel and its Chino Basin tributaries are used by the public for recreational activities (REC1 and REC2). This study, due to scheduling conflicts with agency staffs was contracted to Wildermuth Environmental, Inc. (WEI).

The Santa Ana River Beneficial Use Survey (SARBUS) consisted of scheduled site visits to ten locations along the Santa Ana River channel and its Chino Basin tributaries thought to represent popular areas for the public to recreate. This included sites thought to be popular based upon access to the river channel, presence of a beach area, fishing and available parking. Of the ten sites, eight of the sites considered the highest priority were visited each event, with visits to the two remaining two sites alternating every other event. Survey locations used in the study are listed in Table 7 and identified in Figure 8.

Table 7 Santa Ana River Beneficial Use Survey - Locations.

Location	Waterbody	Frequency
Mission Blvd. Overpass	Santa Ana River – Reach 3	Every other event
Martha McLean Park	Santa Ana River – Reach 3	All events
Van Buren Avenue Overpass	Santa Ana River – Reach 3	All events
Riverside Effluent Channel	Santa Ana River – Reach 3	All events
Hole Lake Outlet	Santa Ana River – Reach 3	All events
Hamner Avenue Overpass	Santa Ana River – Reach 3	All events
Below Prado Dam Area	Santa Ana River – Reach 3	All events
Chino – Corona Road	Mill Creek	All events
Below Hellman Ave. Overpass	Mill Creek	All events
Central Avenue Overpass	Chino Creek	Every other event

Field survey teams, consisting of a minimum of two field personnel were tasked to record various physical site data and note observations of recreational use activity. This included the taking of a digital photograph representative of the recreational usage at each site during each event. A blank survey from along with accompanying instructions for completing the form is included as Appendix E.

The field survey included a total of 62 events conducted between November 2004 and the end of August 2005. The complete list of survey dates is included as Table 8. During the spring and summer months, study survey locations were visited during the day between 12 and 5 pm approximately twice every week (once during the weekend and once midweek). During winter months the surveys were only performed twice a month (once during a weekend day and once midweek). In addition, survey locations were surveyed on Monday 5–30–05 (Memorial Day), Monday 7–4–05 (Independence Day) and Thursday 5–5–05 (Cinco de Mayo).

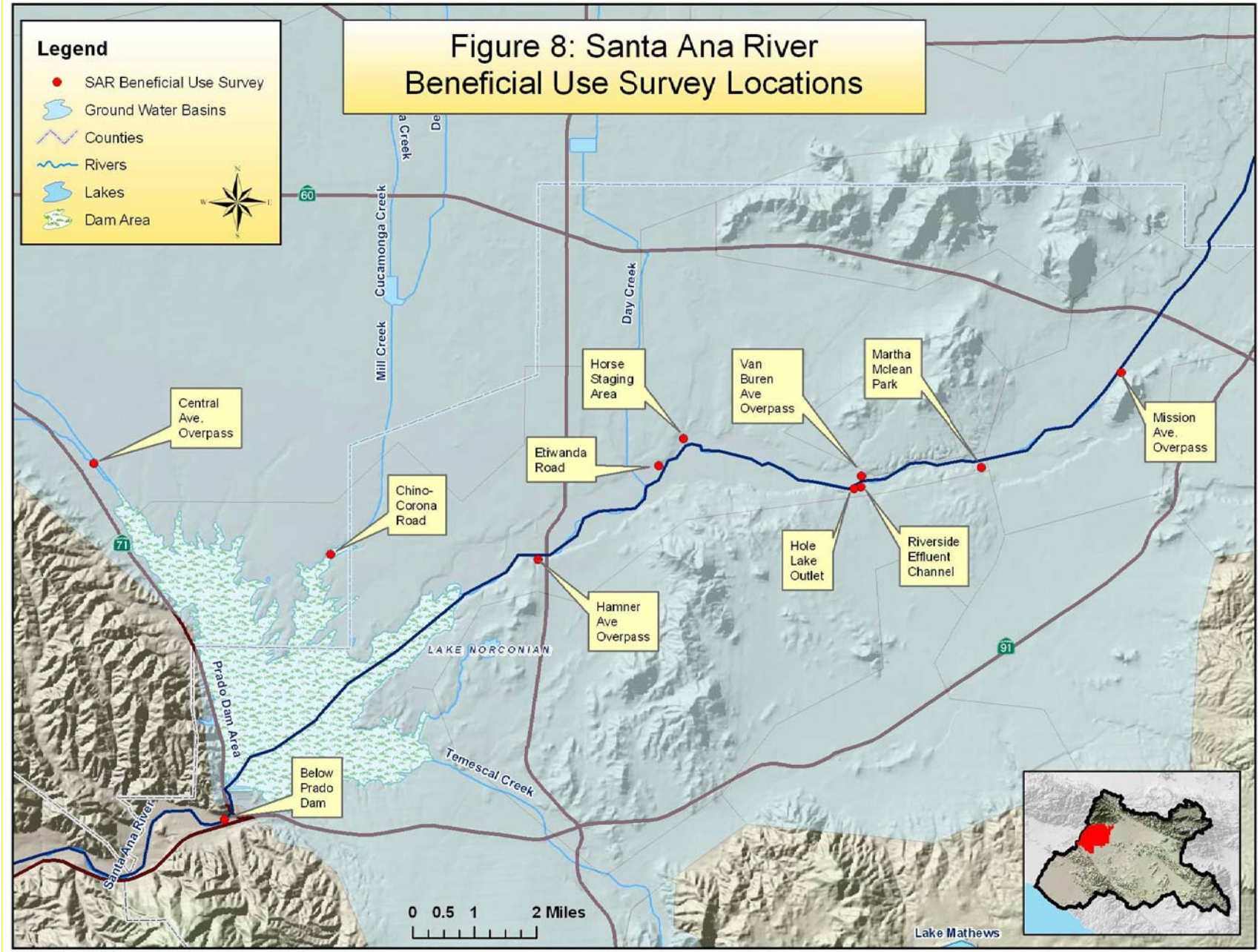


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Table 8 Santa Ana River Beneficial Use Survey - Schedule

Month	Sampling Dates
November 2004	Tues/Wed/Thurs - 10th Saturday/Sunday - 6th, 13th, 20th, 28th
December 2004	Tues/Wed/Thurs - 15th Saturday/Sunday - 4th, 18th
January 2005	Tues/Wed/Thurs - 6th Saturday/Sunday - 15th, 30th
February 2005	Tues/Wed/Thurs - 22nd Saturday/Sunday - 5th, 20th
March 2005	Tues/Wed/Thurs - 9th Saturday/Sunday - 5th, 20th
April 2005	Tues/Wed/Thurs - 5th, 13th, 21st, 26th Saturday/Sunday - 2nd, 10th, 16th, 24th
May 2005	Tues/Wed/Thurs - **5th**, 10th, 18th, 26th, 31st Saturday/Sunday - 1st, 7th, 15th, 28th **Monday 30th**
June 2005	Tue/Wed/Thurs - 2nd, 7th, 15th, 23rd, 28th Saturday/Sunday - 4th, 12th, 18th, 26th
July 2005	**Monday 4th** Thus/Wed/Thurs - 7th, 12th, 20th, 28th Saturday/Sunday - 2nd, 10th, 16th, 24th, 30th
August 2005	Tues/Wed/Thurs - 3rd, 11th, 16th, 24th Saturday/Sunday - 6th, 14th, 21st, 27th

Santa Ana River Beneficial Use Survey - Locations

Prior to initiating the study each survey location was visited to allow the project team to become familiar with the survey sites, the street navigation between sites and to assess the need for any other support materials (such as gate keys, road cones, et cetera). During this field reconnaissance were briefed on health and safety guidelines. A copy of these guidelines is included as Appendix F.

A brief description of each of these survey locations follows.

Mission Blvd. Overpass

Mission Boulevard Overpass is one of the two locations that are visited every other field event. This location is the furthest east along the Santa Ana River. This site is located where the SAR and Mission Boulevard intersect. At this site, the SAR is relatively wide and runs under and perpendicular to the Mission Boulevard Overpass. This site is characterized by gradually sloping

banks, numerous boulders, relatively sparse vegetation, and murky water that is relatively ankle to "adult knee deep."

Martha McLean Park

Martha McLean Park is visited every field event and is located on the Santa Ana River. This site is located below Martha McLean Park. At this site, the SAR is relatively wide and flat. Because of its topography, this site is a great vantage point for observing a vast portion of the SAR—especially upstream of the site. This site is characterized by steep and gradual sloping banks, relatively dense vegetation, and murky water that is typically ankle to "adult knee deep."

Van Buren Ave. Overpass

Van Buren Avenue Overpass is located on the Santa Ana River and is visited every field event. This site is located where the SAR and Van Buren Boulevard intersect. At this site, the SAR runs under and relatively perpendicular to the Van Buren Boulevard Overpass. This site is characterized by gradual sloping banks, numerous boulders, relatively dense vegetation, and clear water.

Riverside Effluent Channel

Riverside Effluent Channel is located just off the Santa Ana River and is visited every field event. This site is located west of the Riverside Regional Water Quality Treatment Plant where the effluent channel passes under the Van Buren Boulevard Overpass. Overall, the effluent channel is relatively narrow. This site is characterized by gradually sloping banks, relatively dense vegetation, and clear water that is ankle deep to "adult knee deep," but can be "adult waist deep" or deeper in some places.

Hole Lake Outlet

Hole Lake Outlet is visited during every field event and is located just downstream from the effluent channel along the Santa Ana River. This site is located west of the Van Buren Boulevard Overpass and the Riverside Effluent Channel site. At this site, the Hole Lake Outlet converges with the effluent channel. This site is characterized by gradually sloping banks, relatively dense vegetation, and murky water that is relatively stagnant and typically "adult knee deep," but can be "adult waist deep" or deeper.

Etiwanda Road

Etiwanda Road is visited during every field event and is located on the Santa Ana River. A total of 28 people at this location have been recorded using the Santa Ana River. This site is located near the intersection of Etiwanda Avenue and 66th Street in the City of Norco. At this site, the SAR is relatively wide. The upstream portion of this site is characterized by gently sloping banks and murky water that is typically ankle deep, but can reach up to "adult knee deep" or deeper. The downstream portion is characterized by moderate to steep sloping banks and murky water that is typically ankle deep to "adult knee deep," but can be "adult mid-thigh deep" or deeper in some places. The Etiwanda site contains thick and relatively thick vegetation.

Hamner Ave. Overpass

Hamner Avenue Overpass is located on the Santa Ana River and is visited during every field event. This site is located west of Interstate 15 and east of the Hamner Avenue Overpass at the terminus of Old Hamner Road. At this site, the SAR is relatively wide and flat. Because of its

topography, this site is a great vantage point for observing both upstream and downstream activities in the SAR. This site is characterized by gradually sloping banks, relatively dense vegetation, and murky water that is ankle deep to "adult knee deep," but can be "adult waist deep" or deeper in some places.

Below Prado Dam Area

Below Prado Dam, which is located on the Santa Ana River and is the furthest location west, is visited every field event. This site is located north of the 91 Freeway and west of the 71 Freeway. After passing under the 71 Freeway, this stretch of the Santa Ana River (SAR) meanders and runs nearly parallel to the 91 Freeway. Following the storms of water year 2005, this site has undergone and continues to undergo construction. The banks of the SAR are relatively steep at this site. Downstream of the construction, the site is characterized by relatively thick vegetation and murky water, which is typically "adult waist deep" or deeper. This location is a popular fishing area.

Chino-Corona Road

Chino-Corona Road is visited every field event and is another popular fishing location. This site is located on Mill Creek, which is a tributary of the Santa Ana River. This stretch of Mill Creek runs under and perpendicular to Chino-Corona Road. On the upstream side of the road, the water is relatively calm. On the downstream side of the road, the channel contains numerous boulders. Overall, the site is characterized by relatively steep banks, thick vegetation, and murky water, which is typically "adult waist deep" or deeper.

Central Ave. Overpass

Central Avenue Overpass is the other location which is visited during every other field event. This location is on Chino Creek, another tributary of the Santa Ana River. This site is located where Chino Creek and Central Avenue intersect. Moreover, Chino Creek runs under and relatively perpendicular to the Central Avenue Overpass. This site is characterized by gradually sloping banks, numerous boulders, sparse vegetation, and relatively clear water.

Horse Staging Area

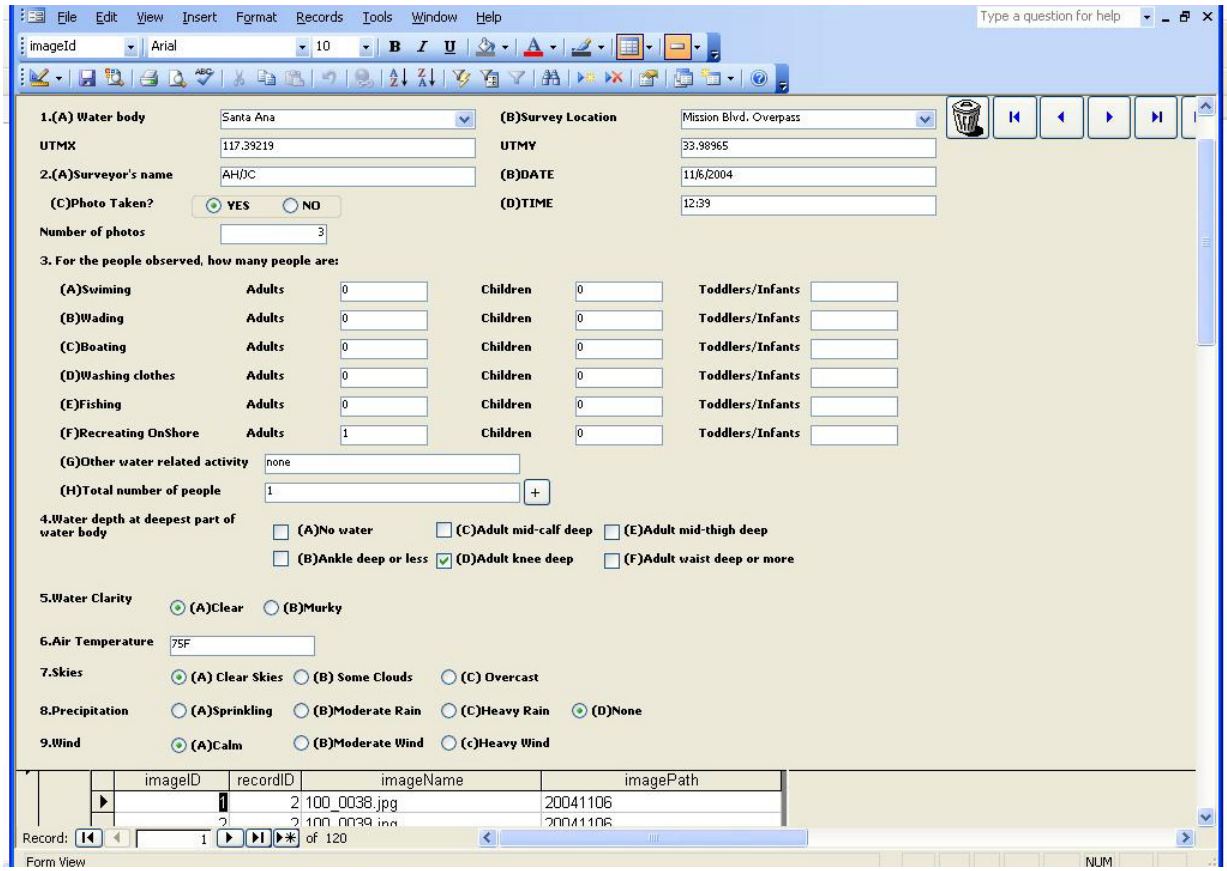
The Horse Staging Area is located on the Santa Ana River and is visited once a month. This site is located north of the Etiwanda Avenue site on the southeast corner of Limonite Avenue and Ridgeview Avenue. At this site, the SAR is relatively wide. This site is characterized by sheer banks that are about ten to fifteen feet high, sparse to moderate vegetation, and murky water that is ankle deep to "adult waist deep" or deeper.

Santa Ana River Beneficial Use Survey - Database

Field survey data and photographs created for SARBUS were transferred and archived in an MS Access database. This tool, created by Wildermuth Environmental, not only provided an efficient means to input and manage data, but also served as a tool to view site photographs. **Figure 9** depicts a screen captured image of this tool's Graphical User Interface (GUI)

This database tool (Appendix G) along with copies of each completed survey form (Appendix H) along with the complete set of digital photographs (Appendix I) are included on compact disks (CDs) attached to the back cover of this report..

Figure 9 Santa Ana River Beneficial Use Survey – MS Access Database



Santa Ana River Beneficial Use Survey - Results

There was limited activity observed along the river and its tributaries from November 2004 through April 2005. However, the survey began after the first two major rain events of the season which took place in late October 2004. Large storm events occurred throughout winter and early spring with the last major event occurring at the end of April 2005. As the river receded and the air and water temperatures increased, more people were observed at the survey locations.

Additionally, larger numbers of people were also observed during weekend events. It was expected that a large number of visitors would be observed on Cinco de Mayo, Memorial Day and July Fourth. An increase in visitors was observed for the two holiday Mondays but there were no visitors counted on Cinco de Mayo (which occurred on a Thursday).

The sections below briefly describe the nature of the observations recorded for each of the survey locations. This is followed by **Tables 9, 10** and **11** which summarize the data. A detailed event by event record of field observations for each location and each survey date for the duration of the survey is included as **Appendix J**.

Mission Blvd. Overpass

Very few people were observed utilizing the river at the Mission Boulevard Overpass site. Over the course of the survey fifteen adults were observed at the location, eight appeared to be swimming and seven were recreating onshore (Figure 10, Figure 11).

Figure 10

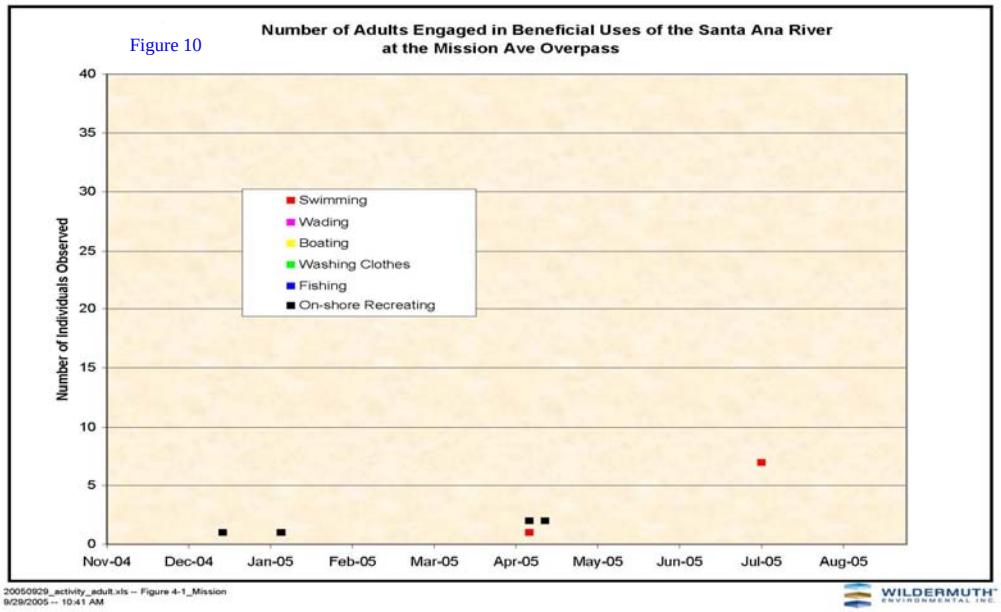
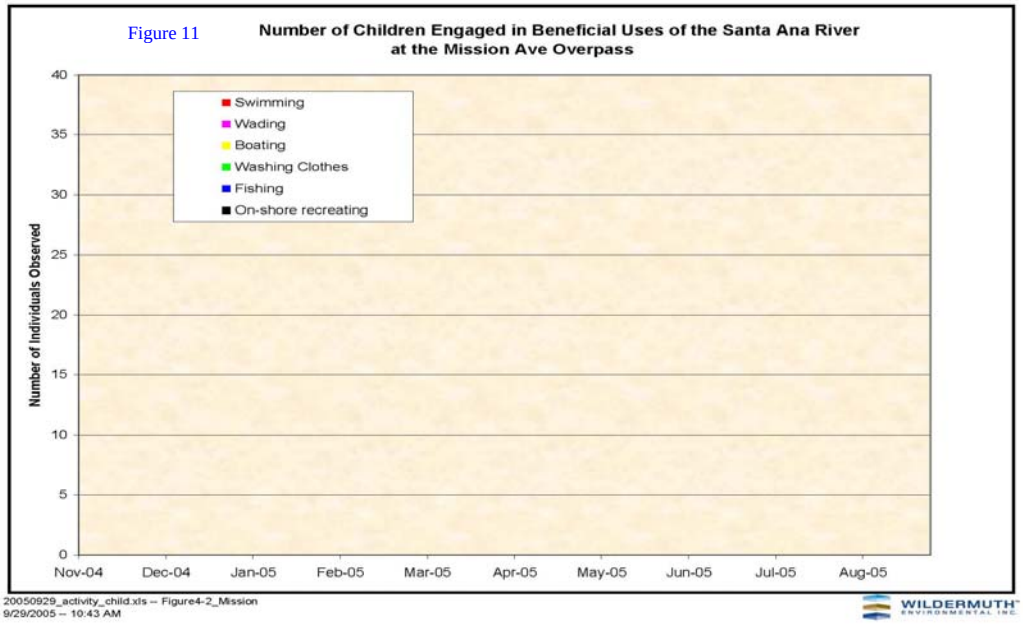


Figure 11



Martha McLean Park

Of all the sites, the Martha McLean Park location had the largest amount of people observed in any one event. On July 4, 2005 a total of 75 people (38 adults and 37 children) were counted swimming in the river. Over the course of the survey 228 people were counted in the river or its bank at this location, most of them engaged in swimming, wading or fishing (Figure 12, Figure 13.

Figure 12

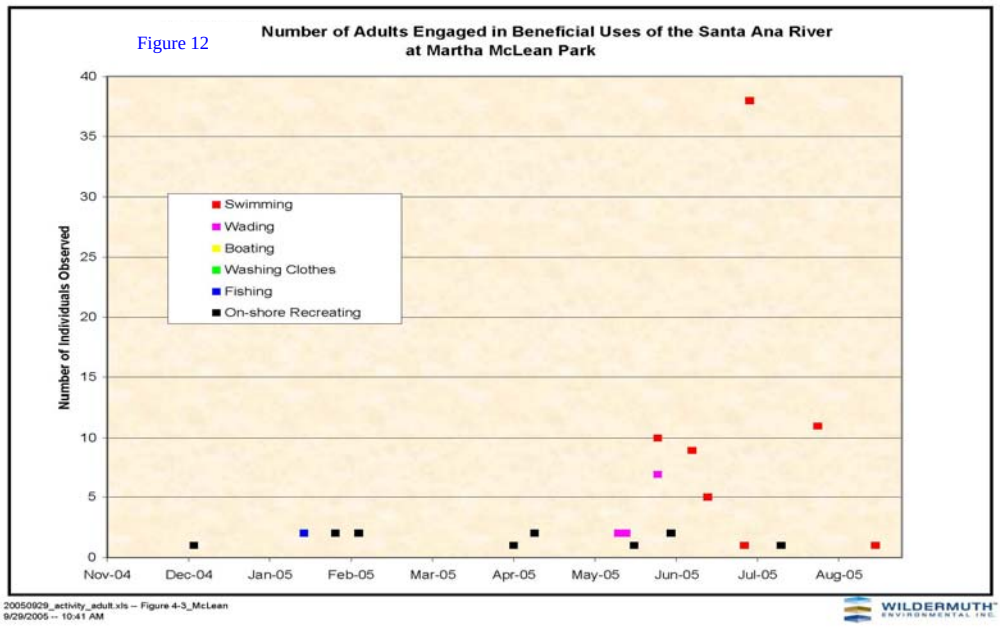
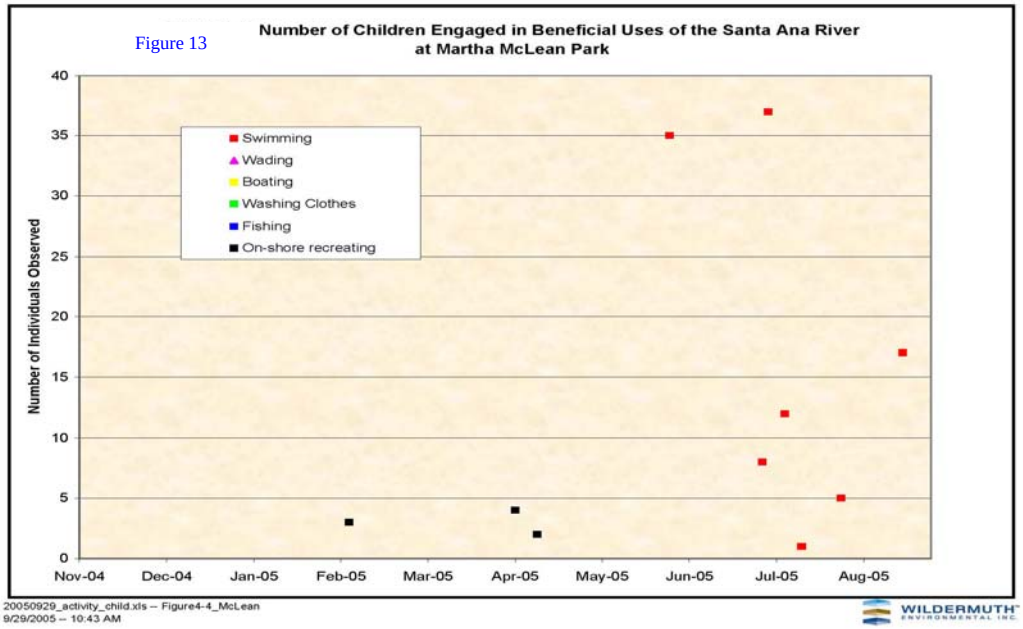


Figure 13



Van Buren Ave. Overpass

A total of 31 people (21 adults and 10 children) were observed at the Van Buren Avenue Overpass site (Figure 14, Figure 15). Most of the people observed were recreating on-shore while the rest were swimming or wading).

Figure 14

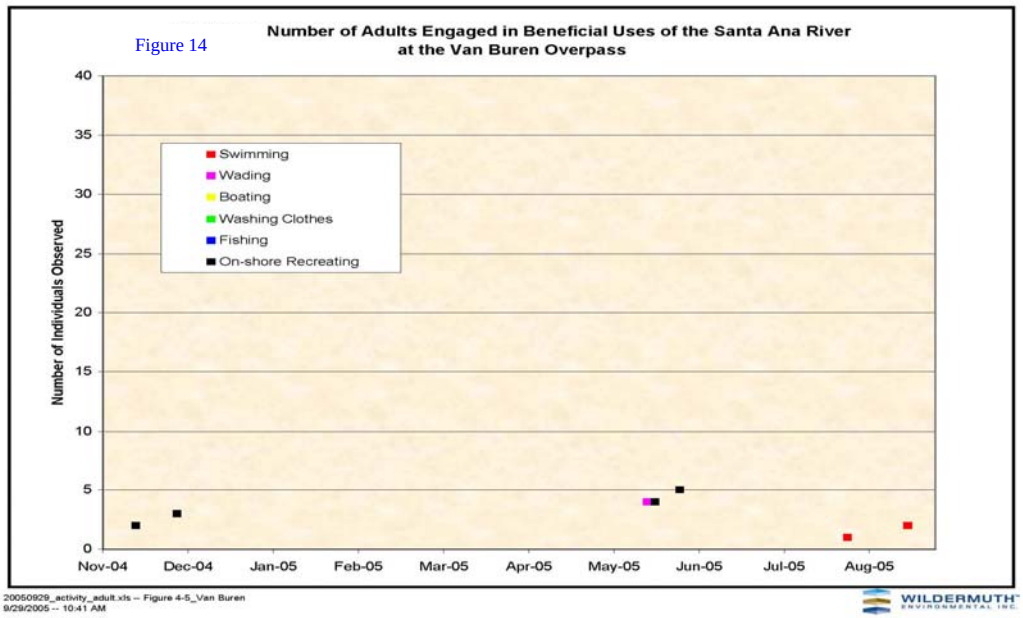
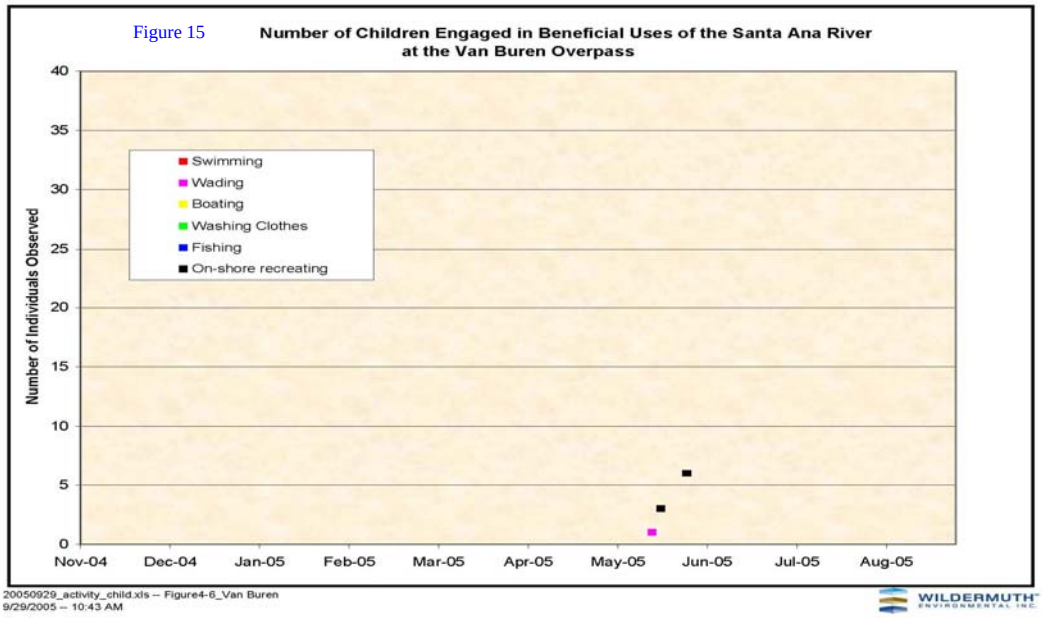


Figure 15



Riverside Effluent Channel

The Riverside Effluent Channel site was the third most highly visited of all the survey locations. A total of 221 visitors were observed at this location, two-thirds of which were observed to be swimming or wading in the water (Figure 16, Figure 17). Most of the rest were recreating on shore.

Figure 16 Number of Adults Engaged in Beneficial Uses of the Riverside Effluent Channel at the Convergence with the Santa Ana River

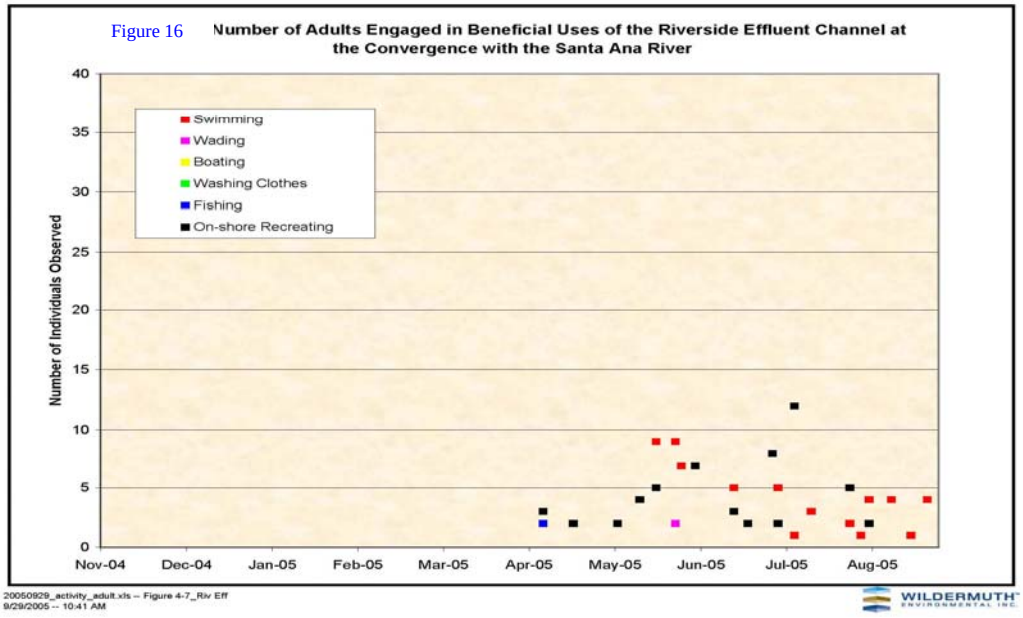
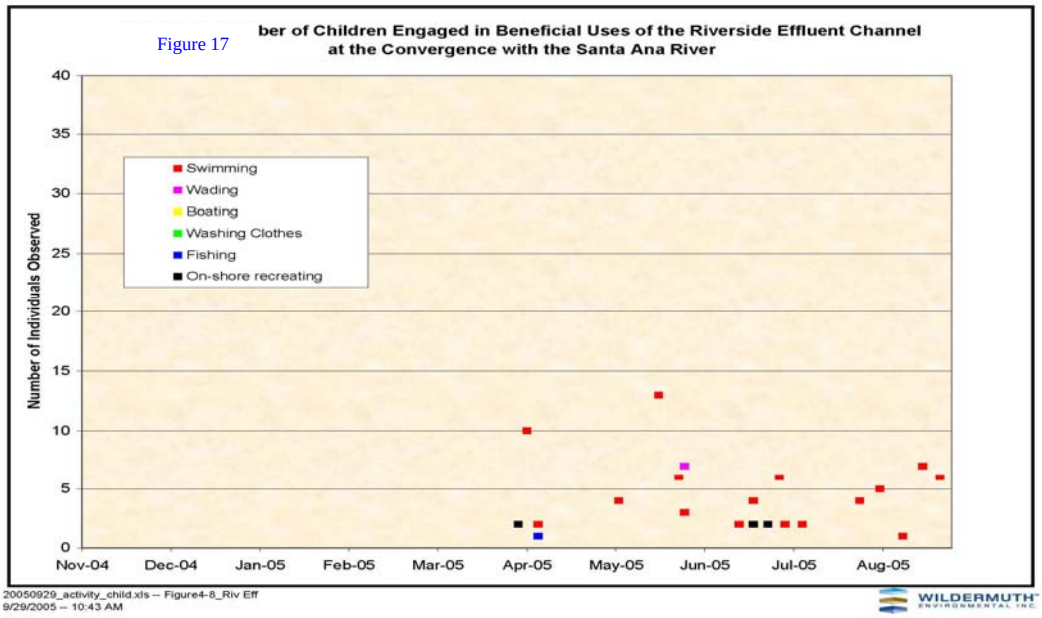


Figure 17 ber of Children Engaged in Beneficial Uses of the Riverside Effluent Channel at the Convergence with the Santa Ana River



Hole Lake Outlet

Very few visitors were observed at the Hole Lake Outlet site. There were less then ten people observed at the location (four adults and two children; Figure 18, Figure 19).

Figure 18

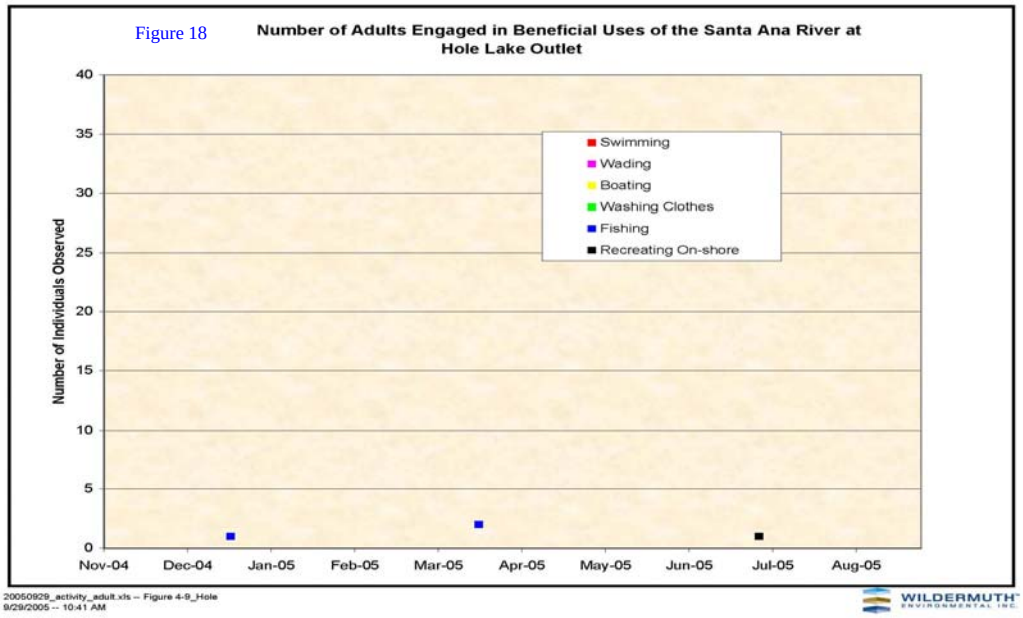
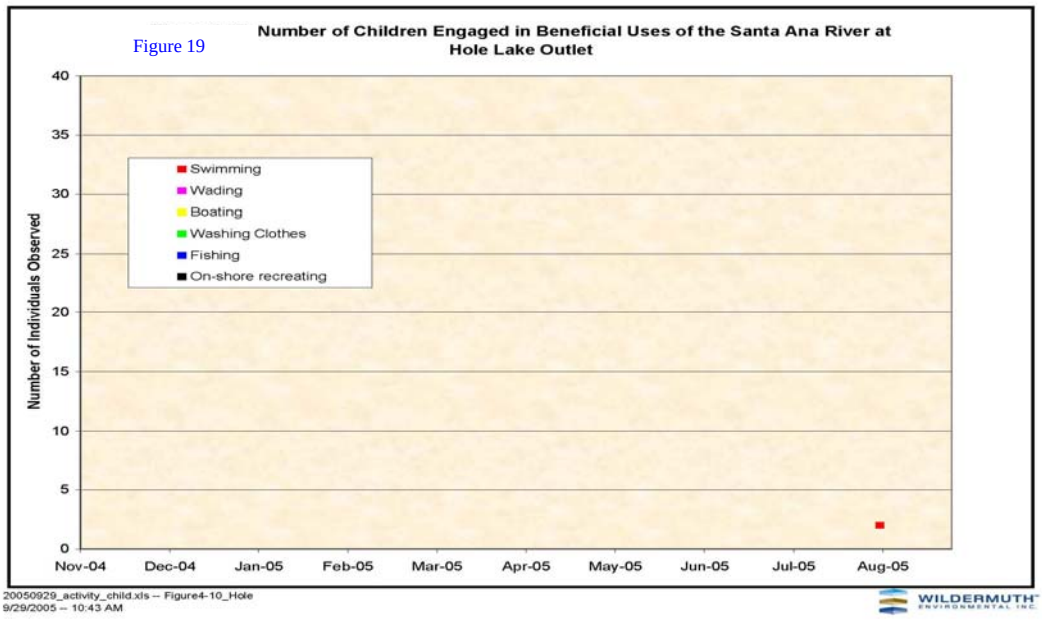


Figure 19



Etiwanda Road

Etiwanda Road was the most highly visited location of all the survey sites. A total of 279 people (176 adults and 103 children) were observed during the duration of the survey. Most of the children were swimming or wading while a majority of the adults were recreating on shore (Figure 20, Figure 21).

Figure 20

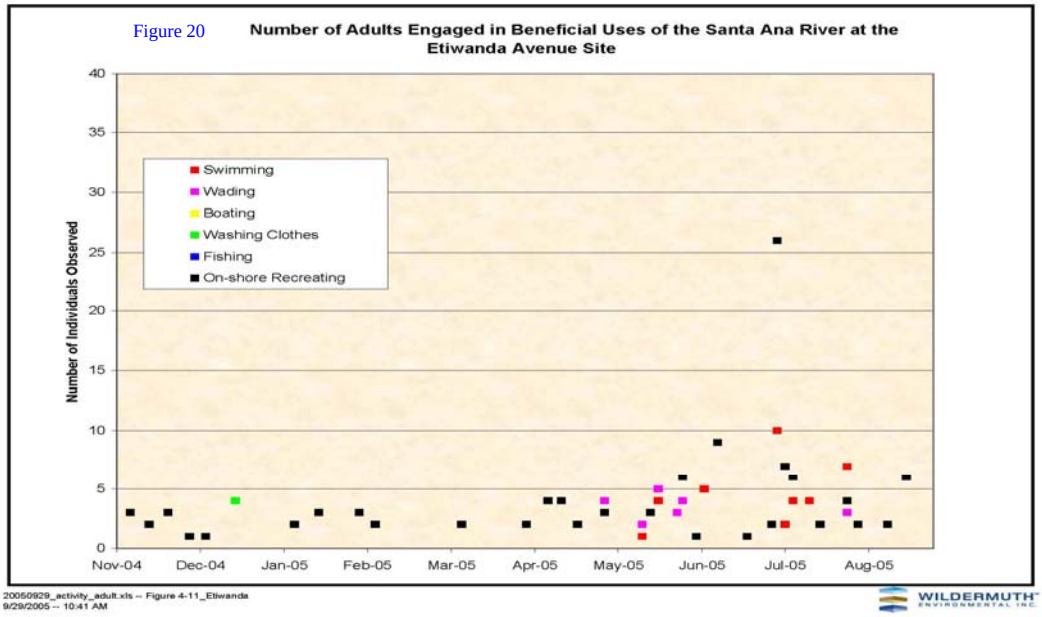
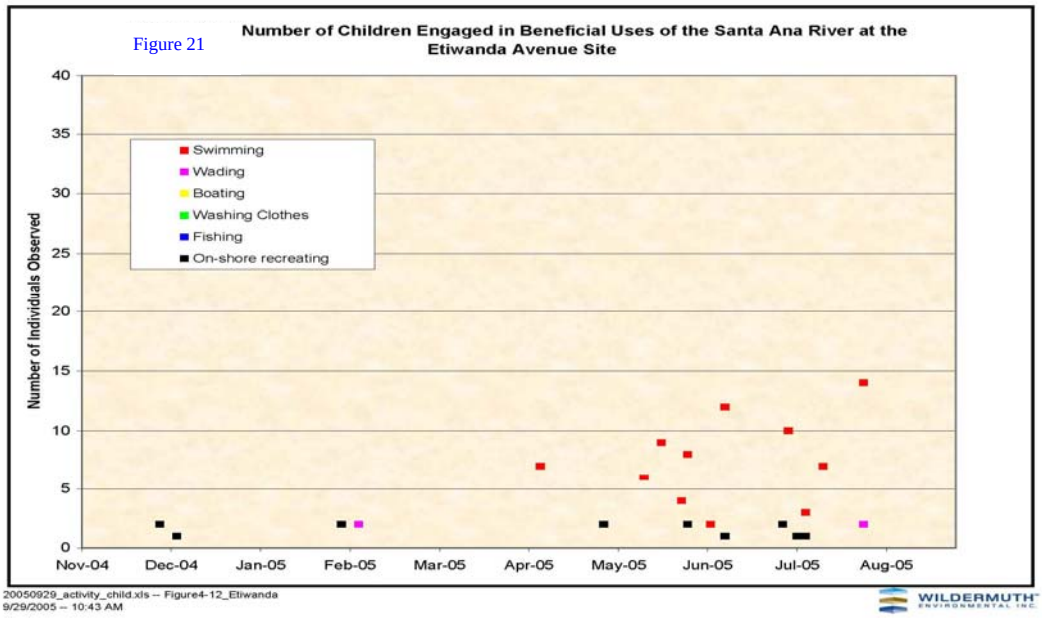


Figure 21



Hamner Ave. Overpass

There were very few visitors observed at the Hamner Avenue Overpass site. Nineteen adults and two children were observed at this location, all but one of them were recreating on-shore (Figure 22 Figure 23). This site is part of a City of Norco park, however, after the Fall 2004 storms, signs were posted closing access to the public due to unsafe conditions.

Figure 22 Number of Adults Engaged in Beneficial Uses of the Santa Ana River at the Hamner Avenue Overpass

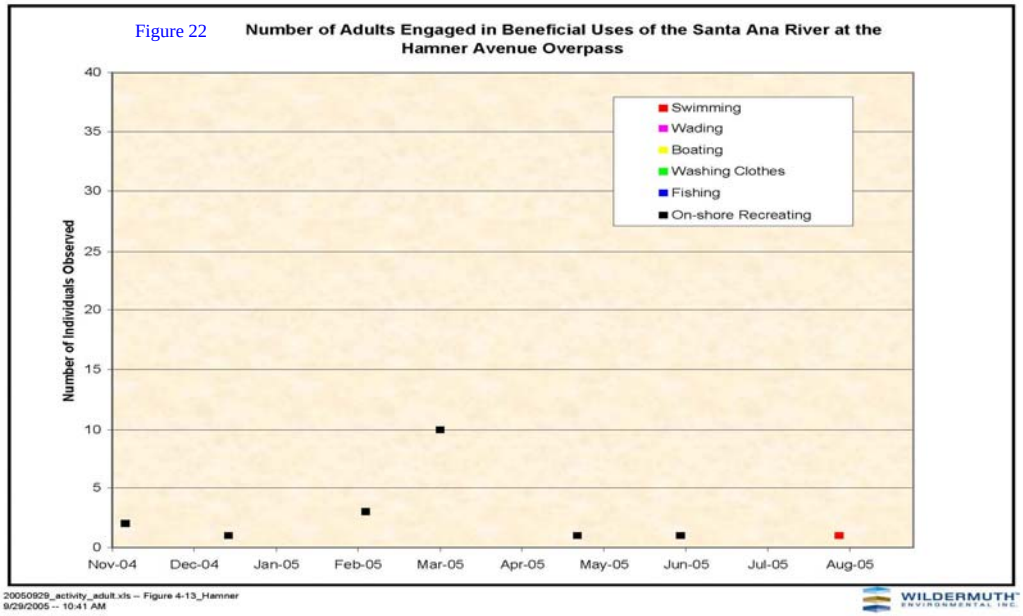
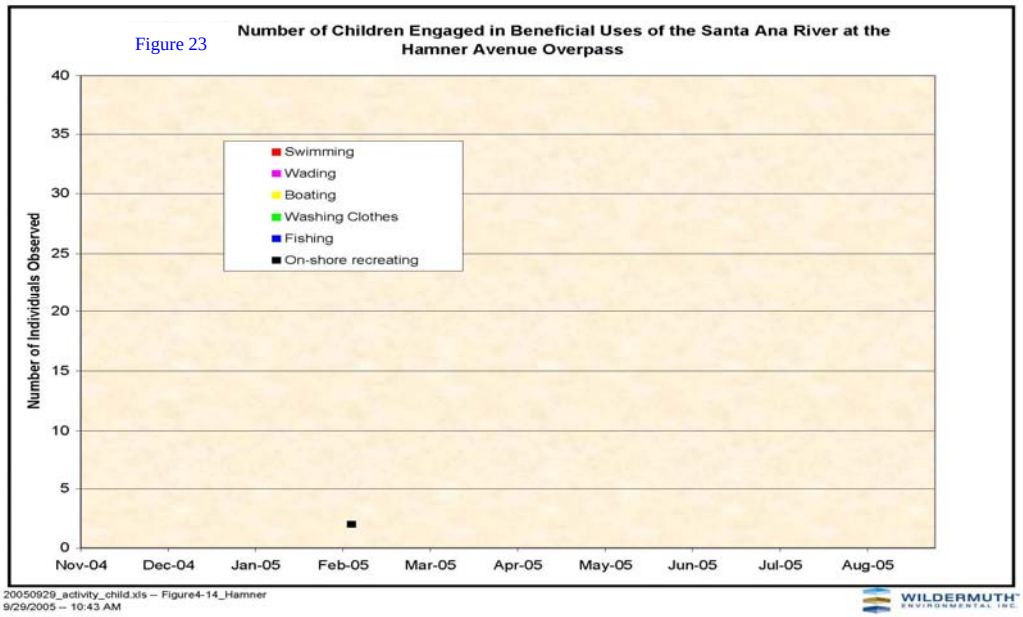


Figure 23 Number of Children Engaged in Beneficial Uses of the Santa Ana River at the Hamner Avenue Overpass



Below Prado Dam Area

The Prado Dam site is a popular location for fishing. A total of 102 people were observed at the site (79 adults and 23 children), of which most were fishing (Figure 24, Figure 25). In April 2005, construction began on the spillway from Highway 71 to the USGS gaging station. The area has been largely disrupted but there has still been visitors regularly observed.

Figure 24

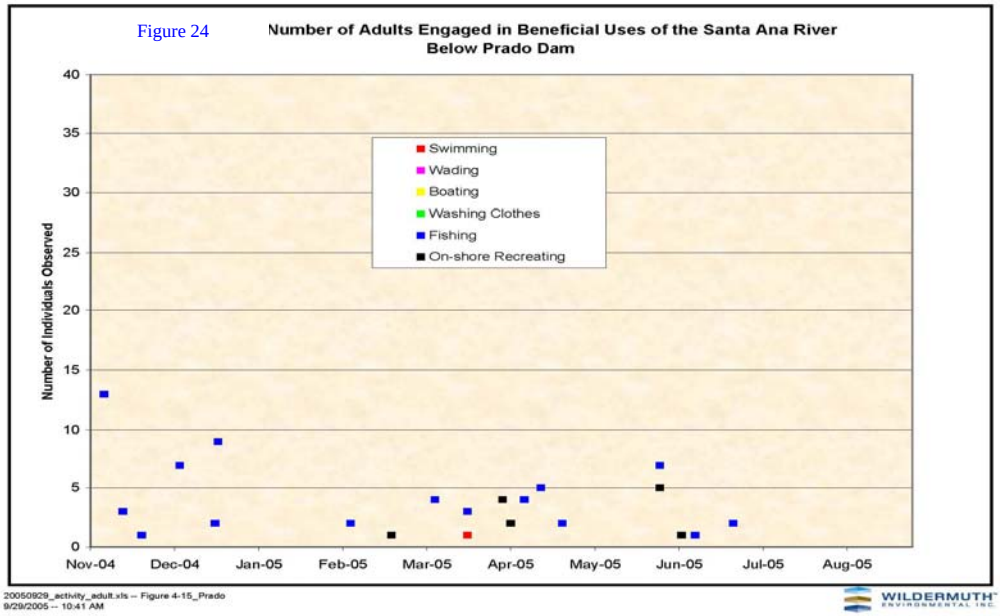
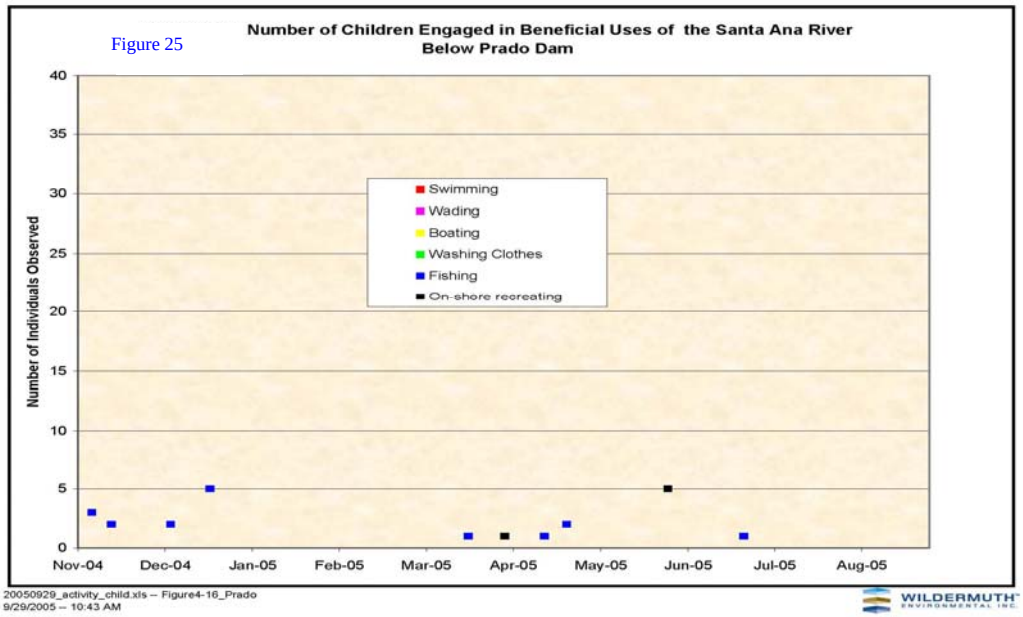


Figure 25



Chino-Corona Road

The Chino-Corona Road site was observed to be subject to moderate amounts of visitors. A total of 73 visitors were observed at the site (64 adults and 9 children). Most of the visitors were fishing or recreating on-shore (Figure 26, Figure 27).

Figure 26 Number of Children Engaged in Beneficial Uses of Mill Creek at Chino-Corona Road

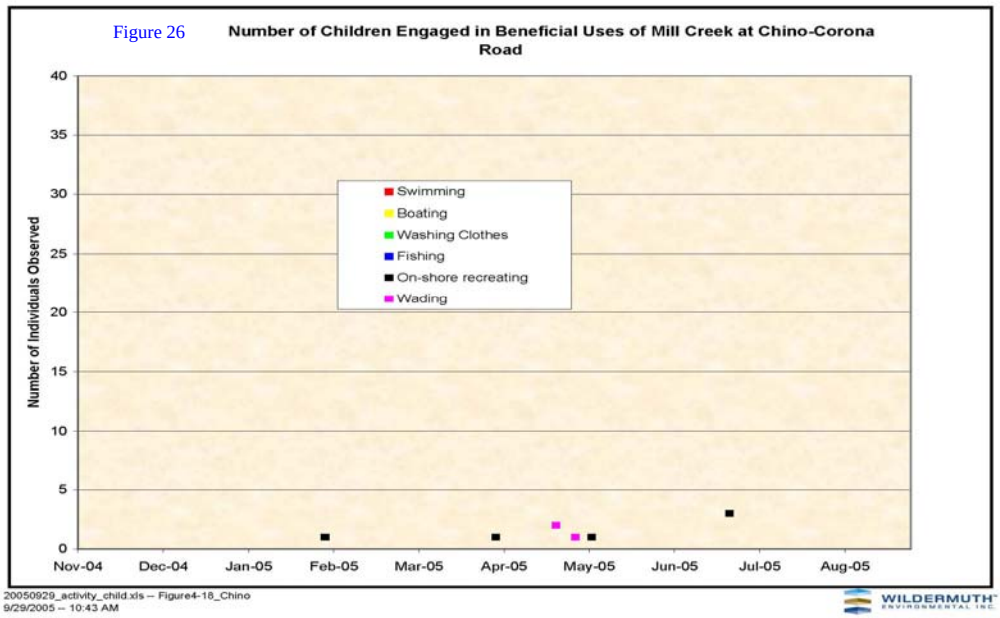
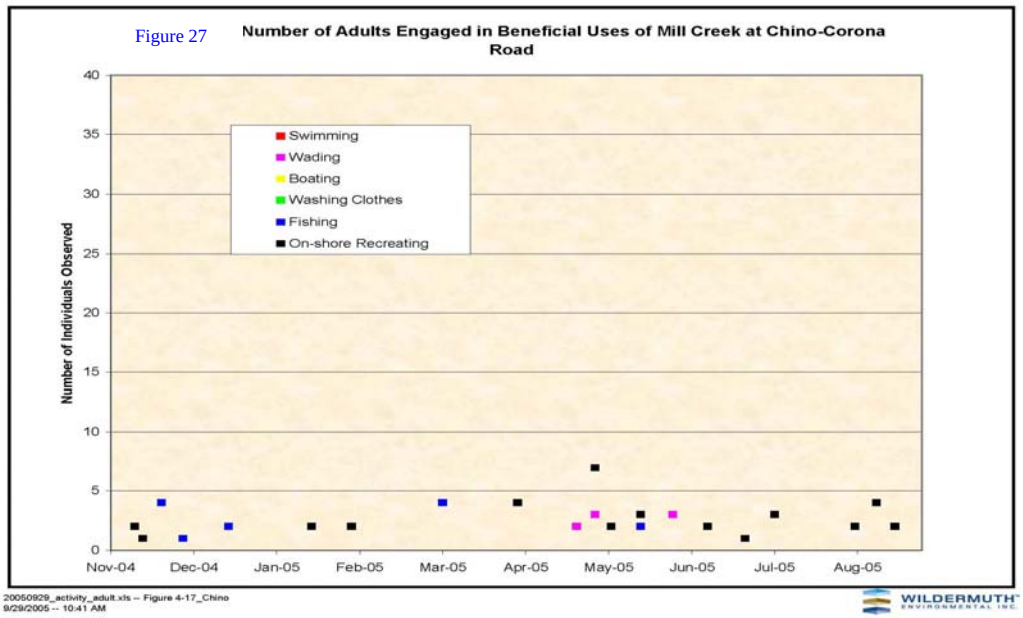


Figure 27 Number of Adults Engaged in Beneficial Uses of Mill Creek at Chino-Corona Road



Central Ave. Overpass

Very few visitors were observed at the Central Avenue Overpass location during the course of the survey. On December 18, 2004, a total of four adults were seen recreating on-shore (Figure 28, Figure 29), but otherwise the site remained unvisited.

Figure 28

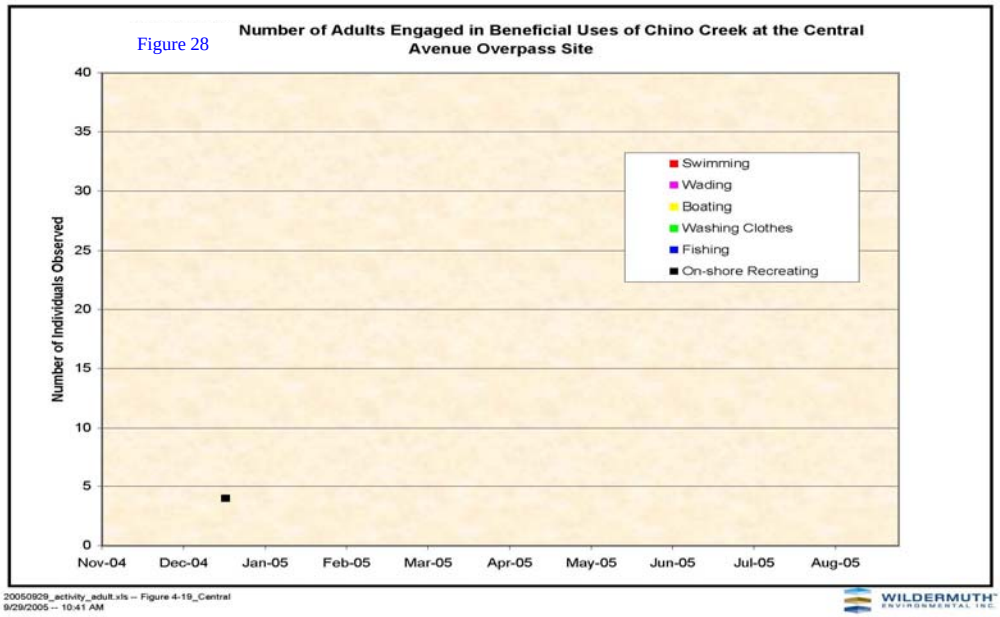


Figure 29

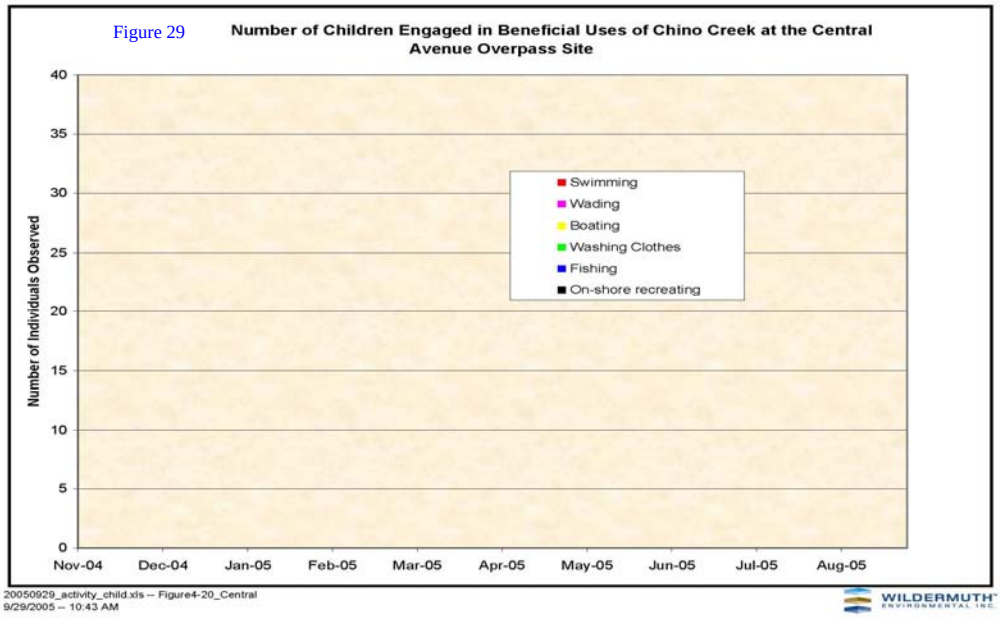


Table 9 Santa Ana River Beneficial Use Survey – Summary of Adults Observed in the Field

	Chino Creek	Mill Creek	Middle Santa Ana River									
Number of Adults Observed	Central Ave. Overpass	Chino-Corona Road	Below Prado Dam Area	Etiwanda Road	Hamner Ave. Overpass	Hole Lake Outlet	Horse Staging Area	Martha McLean Park	Mission Blvd. Overpass	MWD Crossing	Riverside Effluent Channel	Van Buren Ave. Overpass
Swimming	0	2	1	37	1	0	0	77	8	0	59	3
Wading	0	8	0	21	0	0	0	13	0	0	2	4
Washing Cloths	0	0	0	4	0	0	0	0	0	0	0	0
Fishing	0	17	65	0	0	3	0	2	0	0	2	0
Total REC-1	**0**	**27**	**66**	**62**	**1**	**3**	**0**	**92**	**8**	**0**	**63**	**7**
Recreating on-shore	4	37	13	114	18	1	5	12	7	0	57	14
Boating	0	0	0	0	0	0	0	0	0	0	0	0
Total REC-2	**4**	**37**	**13**	**114**	**18**	**1**	**5**	**12**	**7**	0	**57**	**14**
Total All Uses	**4**	**64**	**79**	**176**	**19**	**4**	**5**	**104**	**15**	**0**	**120**	**21**

Table 10. Santa Ana River Beneficial Use Survey – Summary of Youth (11 or under) Observed in the Field

	Chino Creek	Mill Creek	Middle Santa Ana River									
Number of Children Observed	Central Ave. Overpass	Chino-Corona Road	Below Prado Dam Area	Etiwanda Road	Hamner Ave. Overpass	Hole Lake Outlet	Horse Staging Area	Martha McLean Park	Mission Blvd. Overpass	MWD Crossing	Riverside Effluent Channel	Van Buren Ave. Overpass
Swimming	0	0	0	82	0	2	0	115	0	0	84	0
Wading	0	3	0	6	0	0	0	0	0	0	9	1
Washing Cloths	0	0	0	0	0	0	0	0	0	0	0	0
Fishing	0	0	17	0	0	0	0	0	0	0	1	0
Total REC-1	**0**	**3**	**17**	**88**	**0**	**2**	**0**	**115**	**0**	**0**	**94**	**1**
Recreating on-shore	0	6	6	15	2	0	0	9	0	0	7	9
Boating	0	0	0	0	0	0	0	0	0	0	0	0
Total REC-2	**0**	**6**	**6**	**15**	**2**	**0**	**0**	**9**	**0**	**0**	**7**	**9**
Total All Uses	**0**	**9**	**23**	**103**	**2**	**2**	**0**	**124**	**0**	**0**	**101**	**10**

Table 11. Santa Ana River Beneficial Use Survey – Summary of All Field Observations

	Chino Creek	Mill Creek	Middle Santa Ana River									
Total Observed	Central Ave. Overpass	Chino-Corona Road	Below Prado Dam Area	Etiwanda Road	Hamner Ave. Overpass	Hole Lake Outlet	Horse Staging Area	Martha McLean Park	Mission Blvd. Overpass	MWD Crossing	Riverside Effluent Channel	Van Buren Ave. Overpass
Swimming	0	2	1	119	1	2	0	192	8	0	143	3
Wading	0	11	0	27	0	0	0	13	0	0	11	5
Washing Cloths	0	0	0	4	0	0	0	0	0	0	0	0
Fishing	0	17	82	0	0	3	0	2	0	0	3	0
Total REC-1	**0**	**30**	**83**	**150**	**1**	**5**	**0**	**207**	**8**	**0**	**157**	**8**
Recreating on-shore	4	43	19	129	20	1	5	21	7	0	64	23
Boating	0	0	0	0	0	0	0	0	0	0	0	0
Total REC-2	**4**	**43**	**19**	**129**	**20**	**1**	**5**	**21**	**7**	**0**	**64**	**23**
Total All Uses	**4**	**73**	**102**	**279**	**21**	**6**	**5**	**228**	**15**	**0**	**221**	**31**

Aerial Reconnaissance

As part of SARBUS two aerial surveys of the Santa Ana River channel and its Chino Basin tributaries were conducted employing Heli-Flite, a helicopter rental company. These aerial surveys included a preliminary flight on April 21, 2003 to assess the resolution of the photography taken from a helicopter flying low over the river channel. This flight proved successful, however, this flight was not coordinated with the ground survey, nor were many occurrences of recreational activity observed during the flight. The second aerial survey was scheduled for the weekend of July 16, 2005, a day thought to yield significant recreational activity in the river channel. This aerial survey was coordinated with the field survey work conducted by WEI and provided useful information in regards to location areas within the riparian corridor used for recreational activities. An index of the flight plan and a copy of the aerial survey on DVD is included as Appendix K.

Program Summary

Throughout the year, a number of people visited Reach 3 of the Santa Ana River. Adults and children came to the river to swim, wade and recreate on-shore. From November 2004 through August 2005, ten sites were visited three to ten times a month by our survey teams. In general, visitation was higher on weekends and during warmer weather. There was very little visitation during the colder, wet months.

The most visited sites were the Martha McLean Park, Etiwanda Road and the Riverside Effluent Channel. The river at Etiwanda Road and Martha McLean tends to be wider and therefore shallower then other locations. Additionally, both sites offer easy access to the river. The Etiwanda Road site has parking along the street about 100 yards from the river. Martha McLean Park is a regional day-use park with ample parking and recreational facilities on the bluffs above the river. The path is steeper then at Etiwanda but well used. Visitors to the Riverside Effluent Channel typically park off of Van Buren and hike into the site.

The ease with which a site may be reached appears to influence the amount of visitation to the location. As construction activities increased at the site Below Prado Dam, the number of visitors decreased (Figure 24, Figure 25).

Appendix A

Middle Santa Ana River Watershed Pathogen TMDL Workgroup
Public Participation Summary

Appendix B

Wastewater Treatment Facilities in the Middle Santa Ana River

Operator	**Stakeholder Agencies**		
Inland Empire Utilities Agency	- City of Chino Hills - City of Ontario - City of Chino	- City of Montclair - City of Upland - City of Rancho Cucamonga	
Discharge Facility	**Location**	**Daily Discharge**	**Receiving Waters**
A. Regional Plant No. 1 (RP–1)	Ontario	30 MGD	Cucamonga Creek, Valley Reach near Riverside Dr overpass
B. Regional Plant No. 1 (RP–1)	Ontario	8 MGD	Prado Park Lake
C. Regional Plant No. 4 (RP–4)	Rancho Cucamonga	3.5 MGD	Secondary sludge from RP–4 is piped to RP–1 for treatment. Treated effluent from RP–4 is piped to RP–1 and discharged with RP–1 effluent.
D. Regional Plant No. 5 (RP–5),	Chino	3.5 MGD	Chino Creek, Reach 1 through RP–2 discharge system
E. Carbon Canyon Wastewater Reclamation Facility (CCWRF)	Eastern Chino	8.1 MGD	Chino Creek, Reach 2 near Central Ave overpass
Operator	**Stakeholder Agencies**		
Colton San Bernardino Regional Tertiary Treatment and Water Reclamation Authority	- City of Colton - City of San Bernardino		
Discharge Facility	**Location**	**Daily Discharge**	**Receiving Waters**
Regional Tertiary Treatment Rapid Infiltration and Extraction Facility (RIX)	Colton	30 MGD	Santa Ana River, Reach 4 near Riverside Ave overpass
Operator	**Stakeholder Agencies**		
City of Riverside	- City of Riverside - Edgemont Community Services District (ECSD)	- Jurupa Community Services District (JCSD) - Rubidoux Community Services District (RCSD)	
Facility	**Location**	**Daily Discharge**	**Receiving Waters**
Riverside Regional Water Quality Control Plant (RRWQCP)	Riverside	32 MGD	Santa Ana River, Reach 3 near Van Buren Blvd overpass

Operator	**Stakeholder Agencies**		
Western Riverside County Regional Wastewater Authority	- SAWPA - JCSD - City of Norco	- Western Municipal Water District (WMWD) - Home Gardens Sanitary District (HGSD)	
Facility	**Location**	**Daily Discharge**	**Receiving Waters**
Western Riverside County Regional Wastewater Treatment Plant (WRCRWTP)	Unincorporated Riverside County near Norco	2.7 MGD	Santa Ana River, Reach 3 near River Road overpass
Operator	**Stakeholder Agencies**		
City of Corona	City of Corona		
Facility	**Location**	**Daily Discharge**	**Receiving Waters**
A. Municipal Wastewater Treatment Plant No. 1	Northwestern Corona	9.3 MGD	Butterfield Drain, which is tributary to Temescal Creek
B. Municipal Wastewater Treatment Plant No. 2	Eastern Corona	2.75 MGD	Three evaporation – percolation ponds
C. Municipal Wastewater Treatment Plant No. 3	Southeastern Corona	1 MGD	Temescal Creek, Reach 2 near Cajalco Road overpass

Note: Facility specifications and daily discharges based upon 2002 data.

Appendix C

Quality Assurance Project Plan for Chino Basin TMDL Bacteria Monitoring

Insert QAPP PDF

Appendix D

Bacterial Indicator Monitoring Data 2002 – 2004

Table D1: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, February 2002

F. Coli (CFU/100ml)						
Site ID	**Location**	**2–5–02**	**2–7–02**	**2–13–02**	**2–20–02**	**2–27–02**
C1	**Icehouse Cyn Ck**	9	10	10	10	10
C2	**Chino Ck @ Schaeffer Ave.**	8,400	960	6,400	8,000	1,100
C3	**Prado Pk Lake**	350	360	220	310	250
C4	**Chino Ck Above Wetlands**	520	400	200	130	300
C5	**OC Wetlands Effluent**	60	180	150	210	270
C6	**Ch. Ck Below Wetlands**	NA	NA	NA	NA	1,600
M1	**Cucam. Ck. @ CCWD Ponds**	10	10	9	10	10
M2	**Cucam Ck @ RP–1**	6,600	2,300	13,000	7,100	4,700
M3	**Bon View & Merrill**	42,000	2,600	2,100	110,000	900
M4	**Archibald & Cloverdale**	NA	NA	NA	NA	NA
M5	**Mill Ck @ Ch–Cor. Rd**	260	1,240	410	200	120
S1	**SAR @ MWD Xing**	90	50	100	150	100
S2	**SAR Below Prado Dam**	20	30	90	400	710
T. Coli (CFU/100ml)						
Site ID	**Location**	**2–5–02**	**2–7–02**	**2–13–02**	**2–20–02**	**2–27–02**
C1	**Icehouse Cyn Ck**	690	600	450	420	660
C2	**Chino Ck @ Schaeffer Ave.**	130,000	14,000	28,000	22,000	5,400
C3	**Prado Pk Lake**	800	300	590	510	560
C4	**Chino Ck Above Wetlands**	1,000	8,000	380	470	1,100
C5	**OC Wetlands Effluent**	4,300	2,100	3,700	5,300	2,700
C6	**Ch. Ck Below Wetlands**	NA	NA	NA	NA	4,400
M1	**Cucam. Ck. @ CCWD Ponds**	810	700	710	620	650
M2	**Cucam Ck @ RP–1**	110,000	360,000	490,000	220,000	4,900
M3	**Bon View & Merrill**	720,000	350,000	220,000	5,900,000	390,000
M4	**Archibald & Cloverdale**	NA	NA	NA	NA	NA
M5	**Mill Ck @ Ch–Cor. Rd**	4,600	26,000	24,000	2,900	910
S1	**SAR @ MWD Xing**	5,200	390	4,600	5,600	3,900
S2	**SAR Below Prado Dam**	2,300	1,500	2,300	13,000	2,900

Table D2: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, March 2002

F. Coli (CFU/100ml)						
Site ID	**Location**	**3–12–02**	**3–14–02**	**3–20–02**	**3–27–02**	**4–3–02**
C1	**Icehouse Cyn Ck**	10	10	10	10	10
C2	**Chino Ck @ Schaeffer Ave.**	3,800	830	12,000	20	640
C3	**Prado Pk Lake**	260	550	120	210	140
C4	**Chino Ck Above Wetlands**	320	510	70	140	180
C5	**OC Wetlands Effluent**	230	270	140	180	260
C6	**Ch. Ck Below Wetlands**	NA	630	290	10	80
M1	**Cucam. Ck. @ CCWD Ponds**	10	10	10	10	10
M2	**Cucam Ck @ RP–1**	2,500	3,100	3,900	2,400	6,000
M3	**Bon View & Merrill**	7,500	5,000	160,000	110,000	NA
M4	**Archibald & Cloverdale**	NA	NA	NA	NA	NA
M5	**Mill Ck @ Ch–Cor. Rd**	160	110	120	140	170
S1	**SAR @ MWD Xing**	480	180	130	160	110
S2	**SAR Below Prado Dam**	420	510	530	60	130
T. Coli (CFU/100ml)						
Site ID	**Location**	**3–12–02**	**3–14–02**	**3–20–02**	**3–27–02**	**4–3–02**
C1	**Icehouse Cyn Ck**	560	570	420	360	570
C2	**Chino Ck @ Schaeffer Ave.**	127,000	68,000	1,000,000	410	7,300
C3	**Prado Pk Lake**	53,000	3,800	1,200	5,900	100
C4	**Chino Ck Above Wetlands**	2,400	2,200	2,600	4,800	4,400
C5	**OC Wetlands Effluent**	6,300	4,000	4,200	2,200	28,000
C6	**Ch. Ck Below Wetlands**	NA	22,000	36,000	22,000	3,400
M1	**Cucam. Ck. @ CCWD Ponds**	480	450	300	310	330
M2	**Cucam Ck @ RP–1**	71,000	63,000	830,000	110,000	86,000
M3	**Bon View & Merrill**	320,000	330,000	9,200,000	5,000,000	NA
M4	**Archibald & Cloverdale**	NA	NA	NA	NA	NA
M5	**Mill Ck @ Ch–Cor. Rd**	27,000	13,000	3,600	570	2,200
S1	**SAR @ MWD Xing**	9,000	5,200	4,700	7,100	33,000
S2	**SAR Below Prado Dam**	3,400	5,700	79,000	2,000	2,900

Table D3: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, July 2002

F. Coli (CFU/100ml)						
Site ID	**Location**	**7–10–02**	**7–17–02**	**7–24–02**	**7–31–02**	**8–7–02**
C1	**Icehouse Cyn Ck**	60	90	20	9	120
C2	**Chino Ck @ Schaeffer Ave.**	12,000	3,000	8,000	1,100	90
C3	**Prado Pk Lake**	130	50	200	120	130
C4	**Chino Ck Above Wetlands**	180	120	270	90	190
C5	**OC Wetlands Effluent**	960	1,100	590	500	1,650
C6	**Ch. Ck Below Wetlands**	480	500	1,200	700	500
M1	**Cucam. Ck. @ CCWD Ponds**	40	60	10	20	20
M2	**Cucam Ck @ RP–1**	4,500	19,000	50,000	16,000	30,000
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	1,800	2,000	1,000	800	1,000
S1	**SAR @ MWD Xing**	510	390	330	260	120
S2	**SAR Below Prado Dam**	330	500	500	500	1,000
T. Coli (CFU/100ml)						
Site ID	**Location**	**7–10–02**	**7–17–02**	**7–24–02**	**7–31–02**	**8–7–02**
C1	**Icehouse Cyn Ck**	600	1,800	550	370	910
C2	**Chino Ck @ Schaeffer Ave.**	15,000	20,000	20,000	1,200	2,000
C3	**Prado Pk Lake**	1,800	9,900	2,500	5,000	7,000
C4	**Chino Ck Above Wetlands**	2,000	6,000	9,000	2,800	4,000
C5	**OC Wetlands Effluent**	2,300	14,000	3,100	3,900	3,200
C6	**Ch. Ck Below Wetlands**	3,100	8,000	3,300	1,200	2,600
M1	**Cucam. Ck. @ CCWD Ponds**	800	500	210	300	100
M2	**Cucam Ck @ RP–1**	70,000	40,000	140,000	60,000	120,000
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	17,000	3,000	11,000	700	5,000
S1	**SAR @ MWD Xing**	43,000	110,000	68,000	28,000	32,000
S2	**SAR Below Prado Dam**	4,600	10,000	2,900	1,700	2,400

Table D4: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, September 2002

F. Coli (CFU/100ml)						
Site ID	**Location**	**9–11–02**	**9–18–02**	**9–25–02**	**10–2–02**	**10–9–02**
C1	**Icehouse Cyn Ck**	200	100	NS fire	9,400	30
C2	**Chino Ck @ Schaeffer Ave.**	360	3,200	10	90	4,200
C3	**Prado Pk Lake**	NS Lk dry	NS Lk dry	NS Lk dry	1,000	170
C4	**Chino Ck Above Wetlands**	790	880	400	2,000	160
C5	**OC Wetlands Effluent**	870	4,600	1,100	2,000	540
C6	**Ch. Ck Below Wetlands**	340	570	1,000	560	480
M1	**Cucam. Ck. @ CCWD Ponds**	30	20	9	50	10
M2	**Cucam Ck @ RP–1**	10,000	4,800	13,000	11,000	9,000
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	1,600	1,000	1,800	2,000	700
S1	**SAR @ MWD Xing**	370	300	500	640	510
S2	**SAR Below Prado Dam**	320	440	450	450	250
T. Coli (CFU/100ml)						
Site ID	**Location**	**9–11–02**	**9–18–02**	**9–25–02**	**10–2–02**	**10–9–02**
C1	**Icehouse Cyn Ck**	6,900	14,000	NS fire	1,200	6,800
C2	**Chino Ck @ Schaeffer Ave.**	2,500	17,000	80	65,000	22,000
C3	**Prado Pk Lake**	NS Lk dry	NS Lk dry	NS Lk dry	3,200	800
C4	**Chino Ck Above Wetlands**	1,200	1,000	300	5,600	2,000
C5	**OC Wetlands Effluent**	4,200	49,000	41,000	22,000	50,000
C6	**Ch. Ck Below Wetlands**	1,500	2,700	1,000	2,000	8,000
M1	**Cucam. Ck. @ CCWD Ponds**	70	3,300	150	130	130
M2	**Cucam Ck @ RP–1**	30,000	45,000	61,000	50,000	51,000
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	1,300	10,000	4,300	4,600	4,000
S1	**SAR @ MWD Xing**	14,200	37,000	49,000	21,000	67,000
S2	**SAR Below Prado Dam**	1,500	2,500	3,000	3,500	4,000

Table D5: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, January/February 2003

F. Coli (CFU/100ml)						
Site ID	**Location**	**1–8–03**	**1–15–03**	**1–22–03**	**1–29–03**	**2–5–03**
C1	**Icehouse Cyn Ck**	9	9	10	10	10
C2	**Chino Ck @ Schaeffer Ave.**	700	570	1,600	2,000	350
C3	**Prado Pk Lake**	120	180	900	480	160
C4	**Chino Ck Above Wetlands**	280	170	310	310	320
C5	**OC Wetlands Effluent**	240	510	360	430	670
C6	**Ch. Ck Below Wetlands**	NS	NS	NS	80	250
M1	**Cucam. Ck. @ CCWD Ponds**	9	9	10	10	10
M2	**Cucam Ck @ RP–1**	20,000	16,000	13,000	2,200	1,200
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	510	400	570	420	240
S1	**SAR @ MWD Xing**	210	140	160	90	420
S2	**SAR Below Prado Dam**	20	30	20	160	230
T. Coli (CFU/100ml)						
Site ID	**Location**	**1–8–03**	**1–15–03**	**1–22–03**	**1–29–03**	**2–5–03**
C1	**Icehouse Cyn Ck**	790	660	690	1,000	490
C2	**Chino Ck @ Schaeffer Ave.**	160,000	12,000	33,000	40,000	28,000
C3	**Prado Pk Lake**	2,000	1,000	5,400	500	100
C4	**Chino Ck Above Wetlands**	1,000	800	1,000	700	1,000
C5	**OC Wetlands Effluent**	5,800	12,000	7,600	5,000	8,600
C6	**Ch. Ck Below Wetlands**	NS	NS	NS	700	3,000
M1	**Cucam. Ck. @ CCWD Ponds**	680	450	550	310	380
M2	**Cucam Ck @ RP–1**	800,000	290,000	460,000	130,000	83,000
M3	**Bon View & Merrill**	Dry	Dry	Dry	Dry	Dry
M4	**Archibald & Cloverdale**	Dry	Dry	Dry	Dry	Dry
M5	**Mill Ck @ Ch–Cor. Rd**	54,000	3,500	4,400	3,000	3,800
S1	**SAR @ MWD Xing**	4,800	2,500	2,800	4,400	4,400
S2	**SAR Below Prado Dam**	220	100	100	1,000	2,500

Table D6: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, March/April 2003

F. Coli (CFU/100ml)						
Site ID	**Location**	**3–12–03**	**3–19–03**	**3–26–03**	**4–2–03**	**4–9–03**
C1	**Icehouse Cyn Ck**	10	10	10	10	10
C2	**Chino Ck @ Schaeffer Ave.**	330	15,000	160	580	4,800
C3	**Prado Pk Lake**	290	8,200	280	330	120
C4	**Chino Ck Above Wetlands**	240	6,000	2,800	170	370
C5	**OC Wetlands Effluent**	540	470	90	30	480
C6	**Ch. Ck Below Wetlands**	NS	NS	NS	NS	NS
M1	**Cucam. Ck. @ CCWD Ponds**	10	20	10	10	10
M2	**Cucam Ck @ RP–1**	220	700	10	70	380
M3	**Bon View & Merrill**	NS	5,200,000	150,000	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	310	9,000	30	16,000	400
S1	**SAR @ MWD Xing**	270	590	210	70	90
S2	**SAR Below Prado Dam**	10	710	30	370	220
T. Coli (CFU/100ml)						
Site ID	**Location**	**3–12–03**	**3–19–03**	**3–26–03**	**4–2–03**	**4–9–03**
C1	**Icehouse Cyn Ck**	180	310	310	180	210
C2	**Chino Ck @ Schaeffer Ave.**	22,000	230,000	42,000	86,000	94,000
C3	**Prado Pk Lake**	290	16,000	23,000	8,800	5,600
C4	**Chino Ck Above Wetlands**	390	65,000	52,000	5,600	17,000
C5	**OC Wetlands Effluent**	23,000	24,000	120,000	32,000	17,000
C6	**Ch. Ck Below Wetlands**	NS	NS	NS	NS	NS
M1	**Cucam. Ck. @ CCWD Ponds**	320	470	530	320	220
M2	**Cucam Ck @ RP–1**	96,000	14,000	750	9,400	108,000
M3	**Bon View & Merrill**	NS	5,700,000	2,900,000	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	15,000	150,000	3,500	61,000	8,000
S1	**SAR @ MWD Xing**	5,200	17,000	6,200	4,300	790
S2	**SAR Below Prado Dam**	390	9,600	2,300	2,800	660

Table D7: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, January/February 2004

F. Coli (CFU/100ml)						
Site ID	**Location**	**1-7-04**	**1-14-04**	**1-21-04**	**1-28-04**	**2-4-04**
C1	**Icehouse Cyn Ck**	99	9	NS	9	9
C2	**Chino Ck @ Schaeffer Ave.**	1000	1,170	430	20	50
C3	**Prado Pk Lake**	99	380	90	110	50
C7	**Chino Ck @ Central**	290	160	130	60	220
C8	**Chino Ck @ Prado GC**	90	500	560	170	2,900
M1	**Cucam. Ck. @ CCWD Ponds**	9	9	9	9	9
M2	**Cucam Ck @ RP–1**	1,500	3,500	9,300	470	2,800
M3	**Bon View & Merrill**	NS	NS	NS	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	110	270	5,700	100	360
S1	**SAR @ MWD Xing**	200	180	140	99	390
S2	**SAR Below Prado Dam**	9	9	20	20	3,200
S3	**SAR @ Hamner**	170.0	170.0	140.0	150.0	500.0
T. Coli (CFU/100ml)						
Site ID	**Location**	**1-7-04**	**1-14-04**	**1-21-04**	**1-28-04**	**2-4-04**
C1	**Icehouse Cyn Ck**	4,100	340	NS	380	290
C2	**Chino Ck @ Schaeffer Ave.**	21,000	67,000	48,000	970	2,600
C3	**Prado Pk Lake**	200	9,600	400	800	160
C7	**Chino Ck @ Central**	5,100	14,800	15,500	2,900	5,200
C8	**Chino Ck @ Prado GC**	4,200	3,600	37,000	3,200	22,000
M1	**Cucam. Ck. @ CCWD Ponds**	800	1,300	1,100	230	400
M2	**Cucam Ck @ RP–1**	340,000	270,000	4,100,000	250,000	390,000
M3	**Bon View & Merrill**	NS	NS	NS	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	17,000	500	2,600,000	7,700	8,600
S1	**SAR @ MWD Xing**	3,400	200	2,400	2,700	25,000
S2	**SAR Below Prado Dam**	610	1,000	450	560	105,000
S3	**SAR @ Hamner**	3,500	2,200	3,000	3,700	45,000

Table D8: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, February/March 2004

F. Coli (CFU/100ml)						
Site ID	**Location**	**2–11–04**	**2–18–04**	**2–25–04**	**3–3–04**	**3–10–04**
C1	**Icehouse Cyn Ck**	9	9	30	9	9
C2	**Chino Ck @ Schaeffer Ave.**	890	140	30	210	220
C3	**Prado Pk Lake**	80	50	40	170	140
C7	**Chino Ck @ Central**	40	230	90	240	120
C8	**Chino Ck @ Prado GC**	520	470	430	8,400	120
M1	**Cucam. Ck. @ CCWD Ponds**	9	9	NS	9	9
M2	**Cucam Ck @ RP–1**	930	1,230	410	320	9
M3	**Bon View & Merrill**	NS	NS	66,000	32,000	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	220	160	230	450	120
S1	**SAR @ MWD Xing**	150.0	80	200	9,100	99
S2	**SAR Below Prado Dam**	40	20	340	210	9
S3	**SAR @ Hamner**	140	170	130	7,800	160
T. Coli (CFU/100ml)						
Site ID	**Location**	**2–11–04**	**2–18–04**	**2–25–04**	**3–3–04**	**3–10–04**
C1	**Icehouse Cyn Ck**	250	290	290	140	200
C2	**Chino Ck @ Schaeffer Ave.**	16,900	2,900	3,500	250	90
C3	**Prado Pk Lake**	400	3,800	3,000	210	90
C7	**Chino Ck @ Central**	1,400	25,000	5,000	150	600
C8	**Chino Ck @ Prado GC**	4,300	2,400	14,100	1,900	400
M1	**Cucam. Ck. @ CCWD Ponds**	40	140	NS	9	30
M2	**Cucam Ck @ RP–1**	104,000	162,000	28,000	5,300	1,400
M3	**Bon View & Merrill**	NS	NS	220,000	140,000	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	6,900	11,200	10,700	2,500	600
S1	**SAR @ MWD Xing**	940.0	2,500	4,800	1,500	1,200
S2	**SAR Below Prado Dam**	2,200	420	6,600	260	200
S3	**SAR @ Hamner**	2,400	2,200	8,600	1,400	600

Table D9: Middle Santa Ana River Watershed Bacterial Indicator TMDL Monitoring Data, March/April 2004

F. Coli (CFU/100ml)						
Site ID	**Location**	**3–17–04**	**3–24–04**	**3–31–04**	**4–7–04**	**4–14–04**
C1	**Icehouse Cyn Ck**	9	9	9	9	9
C2	**Chino Ck @ Schaeffer Ave.**	9	480	20	330	140
C3	**Prado Pk Lake**	9	9	40	20	70
C7	**Chino Ck @ Central**	160	80	120	380	530
C8	**Chino Ck @ Prado GC**	120	250	350	420	460
M1	**Cucam. Ck. @ CCWD Ponds**	9	NS	9	9	9
M2	**Cucam Ck @ RP–1**	300	230	700	400	310
M3	**Bon View & Merrill**	NS	NS	NS	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	9	130	180	340	300
S1	**SAR @ MWD Xing**	160.0	NS	50	210	90
S2	**SAR Below Prado Dam**	9	20	290	20	9
S3	**SAR @ Hamner**	140	99	70	200	80
T. Coli (CFU/100ml)						
Site ID	**Location**	**3–17–04**	**3–24–04**	**3–31–04**	**4–7–04**	**4–14–04**
C1	**Icehouse Cyn Ck**	500	470	270	140	130
C2	**Chino Ck @ Schaeffer Ave.**	30	2,100	200	2,300	140
C3	**Prado Pk Lake**	90	25,000	1,400	60	60
C7	**Chino Ck @ Central**	1,000	1,900	1,100	2,500	2,000
C8	**Chino Ck @ Prado GC**	700	1,600	2,000	320	1,000
M1	**Cucam. Ck. @ CCWD Ponds**	40	NS	40	90	100
M2	**Cucam Ck @ RP–1**	2,100	28,000	11,000	1,900	2,700
M3	**Bon View & Merrill**	NS	NS	NS	NS	NS
M4	**Archibald & Cloverdale**	NS	NS	NS	NS	NS
M5	**Mill Ck @ Ch–Cor. Rd**	70	300	13,000	2,300	300
S1	**SAR @ MWD Xing**	210	NS	140	320	140
S2	**SAR Below Prado Dam**	50	20	300	220	80
S3	**SAR @ Hamner**	1,400	1,260	300	2,100	140

Appendix E

SARBUS Survey Form Template and Instructions

SANTA ANA RIVER BENEFICIAL USE SURVEY FORM

1. (A) Water body _____ (B) Survey Location _____

2. (A) Surveyor's name _____ (B) DATE _____

   (C) Photo Taken? (1) (Yes) (2) (No) (D) TIME _____

3. For the people observed, how many people are:

   (A) Swimming (wet hair): (1) adults _____ (2) children _____

   (B) Wading (in water, but hair dry): (1) adults _____ (2) children _____

   (C) Boating (in a water craft): (1) adults _____ (2) children _____

   (D) Washing clothes: (1) adults _____ (2) children _____

   (E) Fishing: (1) adults _____ (2) children _____

   (F) Recreating Onshore: (1) adults _____ (2) children _____

   (G) Other water related activity (please specify activity) _____

   (H) TOTAL NUMBER OF PEOPLE _____

4. Water depth at deepest part of water body (circle one – estimate if no one is in water):

   (A) (no water) (B) (ankle deep or less) (C) (adult mid–calf deep)

   (D) (adult knee deep) (E) (adult mid–thigh deep) (F) (adult waist deep or more)

5. Water Clarity: (A) clear (B) murky

6. Air Temperature: (A) _____

7. Skies: (A) (clear skies) (B) (some clouds) (C) (overcast)

8. Precipitation: (A) (sprinkling rain) (B) (moderate rain) (C) (heavy rain)

9. Wind: (A) (calm) (B) (moderate wind) (C) (heavy wind)

INSTRUCTIONS FOR COMPLETING SARBUS FORM

1. (A) Write down the name of the water body for the assigned survey location.

   (B) Write down the Survey Location identification number.

2. (A) Write down the names or initials of the people in the survey group.

   (B) Write down the corresponding date for each survey event.

   (C) Circle the appropriate response regarding whether a photo was taken for each survey location during each survey event.

   (D) Write down the time during which each survey event is performed.

3. (A) Count up the number of children and adults, if any, who appear to have wet hair. Write down the totals in the appropriate spaces.

   (B) Count up the number of children and adults, if any, who are in the water, but are not engaged in any activity listed above or below, and who do not have wet hair. Write down the totals in the appropriate spaces.

   (C) Count up the number of children and adults who are in any kind of watercraft, but are not engaged in any activity listed above or below, and who do not have wet hair. Write down the totals in the appropriate spaces.

   (D) Count up the number of children and adults who appear to be washing clothes in the subject water body and are not engaged in any activity listed above or below. Write down the totals in the appropriate spaces.

   (E) Count up the number of children and adults who are fishing and are not engaged in any other activity listed above or below. Write down the totals in the appropriate spaces.

   (F) Count up the number of children and adults who are near, but not in, the water body, and who are not engaging in any of the activities identified above or below. Write down the totals in the appropriate spaces.

   (G) Count up the number of children and adults who are at the survey location, and who are not engaging in any of the activities identified above. On the form, indicate the specific activities that people are performing and the total number of people performing those activities.

   (H) Add up the total number of adults and children identified in all of the activities indicated above and write the total in the appropriate space.

4. Estimate the depth of water at the survey location using the criteria provided on the form. Circle the appropriate response. If no one is in the water, indicate such condition on the form.

5. For water clarity, circle (A) if you can see the bottom of the water body. Circle (B) if you cannot see the bottom of the water body.

6. Write down the air temperature as indicated on the thermometer.

7. For sky conditions, circle (A) if there are only a few scattered clouds or less, circle (B) if the sky is cloudy, but you can still see some of the blue sky, circle (C) if the entire sky is covered by clouds and no blue–sky can be seen.
8. For precipitation, circle (A) if there is enough precipitation to make the ground wet, but not enough to make puddles, circle (B) if there is enough precipitation to make the ground wet and to make puddles, circle (C) if there is enough to make puddles and there is significant sheetflow on paved surfaces. Do not circle any if there is no precipitation.
9. For wind conditions, circle (A) if there is intermittent gentle breezes or less, circle (B) if there is consistent wind, but not enough to lift dust up into the air, circle (C) if there are consistent Santa Ana type wind conditions (visible dust and trash blown in the air and along the ground, trees and bushes bent noticeably by the wind, hats in danger of being carried off of head by wind).

Appendix F

SARBUS Health and Safety Guidelines

SARBUS HEALTH AND SAFETY ISSUES

HAZARDS

1. Slip, Trip, and Fall – Wet, slippery slopes, dense foliage, unstable slopes and surfaces.

Precautions – Participants must closely observe land conditions, wear proper clothes and footwear. Avoid dangerous condition.

2. Wildlife – Snakes, dogs, bees, etc.

Precautions – Participants must closely observe ground conditions and any animals in vicinity of survey location. Avoid dangerous conditions.

3. Weather – Extremely hot, unusually cold, wet

Precautions – Participants must wear clothes, hats, footwear, and raingear suitable for weather conditions.

4. People – Transient, homeless, intoxicated, belligerent

Precautions – Participants must closely observe people in vicinity of survey location. Do not proceed to any location without at least one survey partner. Do not attempt to advise, direct, or instruct people in any kind of behavior. Avoid dangerous conditions

5. Plants – Cactus, poison ivy, poison oak, etc.

Precautions – Participants must closely observe land conditions, wear proper clothes, and footwear. Avoid dangerous conditions.

6. Traffic – Large volumes of traffic, fast–moving traffic, off–road vehicles, etc.

Appendix G

SARBUS MS Access Database Tool

(Included on CD)

Appendix H

Completed SARBUS Field Worksheets

(Included on CD)

Appendix I

SARBUS Photo Database

(Included on CD)

Appendix J

SARBUS Individual Site and Event Observations

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Mission Blvd. Overpass	11/6/2004	0	0	0	0	0	0	0	0	0	0	1	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	1	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	1	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	1	0	0	0	0	0	0	0	0	0	2	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	2	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/7/2005	7	0	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Martha McLean Park	11/6/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	1	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	2	0	0	0	0	0	2	0	0	0
	1/27/2005	0	0	0	0	0	0	0	0	0	0	2	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	2	3
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	1	4
	4/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	2	2
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	2	0	2	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	2	0	0	0	0	0	0	0	0	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	1	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Martha McLean Park	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	10	35	7	0	0	0	0	0	0	0	0	0
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	2	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	9	0	0	0	0	0	0	0	0	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	5	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	1	8	0	0	0	0	0	0	0	0	0	0
	7/4/2005	38	37	0	0	0	0	0	0	0	0	0	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	0	12	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	1	0	0	0	0	0	0	0	0	1	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	11	5	0	0	0	0	0	0	0	0	0	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	1	17	0	0	0	0	0	0	0	0	0	0
	8/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

		Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
Site	Date	A	C	A	C	A	C	A	C	A	C	A	C
Van Buren Avenue Overpass	11/6/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	2	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	3	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/14/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Van Buren Avenue Overpass	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	4	1	0	0	0	0	0	0	0	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	4	3
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	0	0	0	0	0	0	0	0	0	0	5	6
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	1	0	0	0	0	0	0	0	0	0	0	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	2	0	0	0	0	0	0	0	0	0	0	0
	8/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

WILDERMUTH ENVIRONMENTAL INC.

Total Number of People Recorded at Each Site for the SARBUS

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Riverside Effluent Channel	11/6/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	2
	4/5/2005	0	10	0	0	0	0	0	0	0	0	0	0
	4/10/2005	3	2	0	0	0	0	0	0	2	1	3	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	2	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	4	0	0	0	0	0	0	0	0	2	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	0	0	0	0	0	0	0	0	0	0	4	0
	5/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/21/2005	9	13	0	0	0	0	0	0	0	0	5	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Riverside Effluent Channel	5/28/2005	9	6	2	0	0	0	0	0	0	0	0	0
	5/30/2005	7	3	0	7	0	0	0	0	0	0	0	0
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	7	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	5	2	0	0	0	0	0	0	0	0	3	0
	6/23/2005	0	4	0	0	0	0	0	0	0	0	2	2
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	2	0	0	0	0	0	0	0	2
	7/2/2005	0	6	0	0	0	0	0	0	0	0	8	1
	7/4/2005	5	2	0	0	0	0	0	0	0	0	2	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	1	2	0	0	0	0	0	0	0	0	12	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	3	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	2	4	0	0	0	0	0	0	0	0	5	0
	8/3/2005	1	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	4	5	0	0	0	0	0	0	0	0	2	0
	8/14/2005	4	1	0	0	0	0	0	0	0	0	0	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	2	14	0	0	0	0	0	0	0	0	0	0
	8/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	4	6	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Hole Lake Outlet	11/6/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	1	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/30/2005	0	0	0	0	0	0	0	0	2	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Etiwanda Road	11/6/2004	0	0	0	0	0	0	0	0	0	0	3	1
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	2	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	3	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	1	2
	12/4/2004	0	0	0	0	0	0	0	0	0	0	1	1
	12/14/2004	0	0	0	0	0	0	4	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	2	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	3	0
	1/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	3	2
	2/5/2005	0	0	0	2	0	0	0	0	0	0	2	0
	2/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	2	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	2	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	0	7	0	0	0	0	0	0	0	0	4	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/15/2005	0	0	0	0	0	0	0	0	0	0	4	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	2	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	4	0	0	0	0	0	0	0	3	2
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0

WILDERMUTH ENVIRONMENTAL INC.

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Etiwanda Road	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	1	6	2	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	0	0	0	0	0	0	0	0	3	0
	5/21/2005	4	9	5	0	0	0	0	0	0	0	0	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	4	3	0	0	0	0	0	0	0	0	0
	5/30/2005	0	8	4	2	0	0	0	0	0	0	6	2
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	1	0
	6/7/2005	5	2	0	0	0	0	0	0	0	0	0	0
	6/12/2005	0	12	0	0	0	0	0	0	0	0	9	1
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	1	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	2	2
	7/4/2005	10	10	0	0	0	0	0	0	0	0	26	0
	7/7/2005	2	0	0	0	0	0	0	0	0	0	7	1
	7/10/2005	4	3	0	0	0	0	0	0	0	0	6	1
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	4	7	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	2	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	7	14	3	2	0	0	0	0	0	0	4	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	2	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	2	
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	0	0	0	0	0	0	0	0	0	0	6	0
	8/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Hamner Avenue Overpass	11/6/2004	0	0	0	0	0	0	0	0	0	0	2	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/14/2004	0	0	0	0	0	0	0	0	0	0	1	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	3	2
	2/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	10	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	1	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0

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		Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
Site	Date	A	C	A	C	A	C	A	C	A	C	A	C
Hamner Avenue Overpass	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	1	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/3/2005	1	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0		0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Below Prado Dam Area	11/6/2004	0	0	0	0	0	0	0	0	13	3	0	0
	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/13/2004	0	0	0	0	0	0	0	0	3	2	0	0
	11/20/2004	0	0	0	0	0	0	0	0	1	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	7	2	0	0
	12/15/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/17/2004	0	0	0	0	0	0	0	0	2	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	9	5	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/27/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	2	0	0	0
	2/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	1	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/8/2005	0	0	0	0	0	0	0	0	4	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	1	0	0	0	0	0	0	0	3	1	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	4	1
	4/5/2005	0	0	0	0	0	0	0	0	0	0	2	0
	4/10/2005	0	0	0	0	0	0	0	0	4	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	5	1	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	0	0	0	0	0	0	2	2	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Below Prado Dam Area	5/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	0	0	0	0	0	0	0	0	7	0	5	5
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	1	0
	6/12/2005	0	0	0	0	0	0	0	0	1	0	0	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	2	1	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/24/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/25/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

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Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Chino-Corona Road	11/6/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/10/2004	0	0	0	0	0	0	0	0	2	0	2	0
	11/13/2004	0	0	0	0	0	0	0	0	0	0	1	0
	11/20/2004	0	0	0	0	0	0	0	0	4	0	0	0
	11/28/2004	0	0	0	0	0	0	0	0	1	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/15/2004	0	0	0	0	0	0	0	0	2	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	0	0
	1/6/2005	0	0	0	0	0	0	0	0	0	0	0	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	2	0
	1/30/2005	0	0	0	0	0	0	0	0	0	0	2	1
	2/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/5/2005	0	0	0	0	0	0	0	0	4	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/2/2005	0	0	0	0	0	0	0	0	0	0	4	1
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/24/2005	0	0	2	2	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/1/2005	0	0	3	1	0	0	0	0	0	0	7	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/7/2005	0	0	0	0	0	0	0	0	0	0	2	1
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	0	0	0	0	0	0	2	0	3	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/26/2005	0	0	0	0	0	0	0	0	0	0	0	0

WILDERMUTH ENVIRONMENTAL INC.

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Chino-Corona Road	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/30/2005	0	0	3	0	0	0	0	0	0	0	0	0
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	2	0	0	0	0	0	0	0	0	0	2	0
	6/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/26/2005	0	0	0	0	0	0	0	0	0	0	1	3
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/7/2005	0	0	0	0	0	0	0	0	0	0	3	0
	7/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/3/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/6/2005	0	0	0	0	0	0	0	0	2	0	2	0
	8/14/2005	0	0	0	0	0	0	0	0	0	0	4	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/21/2005	0	0	0	0	0	0	0	0	0	0	2	0
	8/27/2005	0	0	0	0	0	0	0	0	0	0	0	0

Total Number of People Recorded at Each Site for the SARBUS

(A-number of adults observed, C-number of children. Children are classified as those individuals that appear to be less then 11 years old)

Site	Date	Swimming		Wading		Boating		Washing Clothes		Fishing		Recreating On-shore	
		A	C	A	C	A	C	A	C	A	C	A	C
Central Avenue Overpass	11/10/2004	0	0	0	0	0	0	0	0	0	0	0	0
	11/20/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/4/2004	0	0	0	0	0	0	0	0	0	0	0	0
	12/18/2004	0	0	0	0	0	0	0	0	0	0	4	0
	1/15/2005	0	0	0	0	0	0	0	0	0	0	0	0
	2/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/9/2005	0	0	0	0	0	0	0	0	0	0	0	0
	3/20/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/13/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	4/26/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/5/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/21/2005	0	0	0	0	0	0	0	0	0	0	0	0
	5/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/2/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/7/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/12/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/18/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/23/2005	0	0	0	0	0	0	0	0	0	0	0	0
	6/28/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/4/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/10/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/16/2005	0	0	0	0	0	0	0	0	0	0	0	0
	7/30/2005	0	0	0	0	0	0	0	0	0	0	0	0
	8/16/2005	0	0	0	0	0	0	0	0	0	0	0	0

Appendix K

SARBUS Aerial Survey DVD and Flight Plan Index

HELICOPTER FLIGHT ON JULY 16, 2005

SANTA ANA RIVER – REACH 3

CHINO CREEK – REACH 1

MILL CREEK – PRADO AREA

TAPE 1

Time	Location
3.15	Martha McLain Park (10 – 15 people)
8.35	Near RIX Facility (20 – 30 people)
12.10	10 Fwy/215 Fwy Interchange
16.00	Plunge Ck. Confluence
17.40	Hwy 38 (Orange St.) Laundry (1 or 2 people)
23.30 – 26.00	Seven Oaks Dam
27.00	Old bridge (5 – 10 people)
31.25	Hwy 38 Laundry
40.15 – 41.00	RIX Facility (20 – 30 people)
44.30 – 44.40	Mission Blvd. (2 – 5 people)
46.55 – 47.10	Rubidoux Washout Area
47.15	Martha McLain Park (10 – 15 people)
50.50 – 52.00	Van Buren Avenue
55.45	Unknown Area (people)
56.50 – 57.08	Etiwanda Horse Area (25–35 people)

END OF TAPE 1

TAPE 2

00.01	Etiwanda Horse Area (25 – 35 people)
09.45	River Road
11.40	OCWD Prado Wetlands
15.00 – 16.50	Prado Dam Area
19.20	Chino Ck @ Euclid
22.20	Chino Ck @ Central
22.40	Carbon Cyn WRF
27.00	Mill Creek
34.26	END OF TAPE 2