C-11.0 WATER QUALITY MONITORING SUMMARY AND ANALYSES

C-11.1 Introduction

This chapter reviews results and findings from the first year of water quality monitoring conducted by the Orange County Stormwater Program under the Third Term Permit, Order No. R9-2002-0001, from the San Diego Regional Water Quality Control Board. The wet and dry weather monitoring program designs are summarized below and described in much greater detail in two reports previously submitted to the Regional Board and available on the Program's website (http://www.ocwatersheds.com/StormWater/swp_documents_intro.asp). These are:

- Past Monitoring, Future Recommendations, and Receiving Waters Monitoring Program, which summarizes cumulative findings from the First and Second Term Permit monitoring programs, and presents the design of the Third Term Permit wet weather monitoring program; and
- San Diego Region Dry Weather Monitoring Program, which details a dry weather reconnaissance program targeted at identifying potential sources of pollution to the stormwater system.

Because the Third Term Permit monitoring program includes several new elements, and because this is the first year of monitoring under this permit, the ability to conduct cumulative or longer-term assessments of status and trends is necessarily limited. Thus, in most instances, this report is limited to a presentation and discussion of the past year's data. However, as data accumulate over time, subsequent annual reports will be able to provide a more substantive evaluation of patterns and trends.

The Third Term Permit monitoring program also represents an important evolution from previous monitoring in terms of its increased focus on ecological conditions in receiving waters, and on potential stormwater impacts in the nearshore coastal zone. Regional efforts are underway, through both the Stormwater Monitoring Coalition (SMC) and the Southern California Coastal Water Research Project (SCCWRP) to develop improved methods for the analysis and interpretation of such data. Future reports will incorporate these methods as they become available.

The following sections review the historical development of the water quality monitoring program (Section C-11.2), describe the overall monitoring approach (Section C-11.3), summarize monitoring procedures (Section C-11.4) and methods of data analysis (Section C-11.5), and present the monitoring findings (Section C-11.6). The data presented in Section C-11.6 are the result of the water quality monitoring conducted from July 1, 2003 to July 1, 2004. More detailed information specific to data from prior years can be found in each of the prior annual reports and the two prior Reports of Waste Discharge.

C-11.2 Program Development

Passage of an amendment to the Clean Water Act in 1987, the Water Quality Act, brought stormwater discharges into the NPDES Program and subsequent EPA regulations required municipal NPDES Permit applicants to develop a management program to effectively address the requirements of the Act.

In response to these regulations, the County of Orange (the Principal Permittee), the Orange County Flood Control District and incorporated cities (all three collectively referred to as Permittees) obtained NPDES Stormwater Permits No. CA 8000180 and No. CA 0108740 (subsequently referred to as the First Term Permits) from the Santa Ana and San Diego Regional Water Quality Control Boards. In 1996, the First Term Permits were replaced by Permits Nos. CAS0108740 and CAS618030 (subsequently referred to as the Second Term Permits). These have recently been replaced by the Third Term Permits.

The overall evolution of the Program's monitoring efforts during this period are illustrated in **Figure C-11.1**. Overall, the Program's evolution is characterized by:

- Continued development of a longer-term perspective for tracking trends in key pollutants and at high-priority locations

- A specific focus on problem areas and issues

- Attention to an expanding set of concerns related to stormwater, e.g., bioassessment, ambient coastal receiving waters.

11.2.1 Pre-NPDES water quality monitoring

From 1973 to 1990, the Principal Permittee conducted routine water quality monitoring on drainage facilities which are tributary to water bodies identified as waters of the state by the Regional Boards. The receiving waters were also monitored routinely to assess the chronic effects on established beneficial uses.

When the monitoring program was initiated in 1973, monthly nutrient and trace element sampling was performed at several locations. Sediment samples were collected semiannually to assess the impact of contaminant deposition and adsorption. Additional constituents such as mercury, selenium, DDT, PCBs and radioactivity were also evaluated on a semiannual basis to address public concerns regarding the pollution threat from these constituents.

C-11.2.2 First term permit monitoring under Order 90-38

In order to bring the pre-NPDES water quality monitoring program into conformance with the 1990 federal NPDES regulations and the First Term Permit objectives (Section 11.2), field screening to detect gross contamination was added to the program and the number of sampling sites in the channels and receiving waters were increased in order to better assess the amount and type of contamination in the storm drain system.

The First Term Permit water quality monitoring program consisted of field screening (channels only); dry-weather and storm sampling and a receiving water program.

C-11.2.3 Second term permit monitoring under Order 96-03

While the First Term Permit monitoring program produced useful information, the Permittees recognized (as has the rest of the nation) the high degree of uncertainty regarding the link between urban stormwater runoff and actual impairment of beneficial uses within the aquatic resources of Orange County.

Therefore, in response to the Second Term Permit objectives, the Permittees conducted a systematic re-evaluation of the water quality monitoring program which led to a re-statement of the monitoring program's primary goals. The primary and parallel goals of the monitoring program were re-stated as:

- To determine the role, if any, of urban stormwater discharges in the impairment of beneficial uses; and

- To provide technical information to support effective urban stormwater management program actions to reduce the beneficial use impairment determined to be associated with urban stormwater.

In order to organize the vast array of monitoring activities needed to carry out the objectives and goals, the Permittees identified three separate key elements within the Final Monitoring Program (May 1999).

These three key elements were:

- A focus on known sites (or Warm Spots) where constituents are substantially above system-wide averages;

- A parallel (and somewhat overlapping) focus on areas of critical aquatic concern (herein referred to as critical aquatic resources or CARs); and

- A countywide reconnaissance program to identify specific sources of contamination from sub-watershed areas as well as specific land use investigations in order to evaluate the effectiveness of a variety of BMPs

The monitoring program included an underlying rationale for each monitoring element, a discussion of how monitoring data will be used in decision-making, identification of potential links to other relevant monitoring programs being carried out by other agencies, a description of the basic monitoring design, identification of additional study design steps, and a description of anticipated monitoring activities.

These monitoring elements included many locations from the pre-NPDES and First Term Permit water quality monitoring programs that were of value because of the length of their historical record. Each key element of the Final Monitoring Program contains a description of the monitoring activities proposed to accomplish the objectives described above, as well as a description of the process for making decisions about how the monitoring program will respond to incoming data over time. This process was intended to be used at any time throughout the life of the monitoring program to reevaluate the direction of the program, or to reassess the appropriate allocation of resources within the program.

The second term monitoring program and subsequent elements utilized a five-year timeline (1998/99 - 2002/03) for addressing the goals/objectives associated with each task.

C-11.2.4 Third term permit monitoring under Order R9-2002-0001

In 2002 and 03, the Program completed development of the Third Term Permit monitoring programs for wet and dry weather, respectively. This program extends stormwater monitoring to a broader range of locations and to a wider array of methods for measuring impacts. For example, the Third Term monitoring plan will more completely examine storm drains that discharge directly to the coast and pose a potential health risk to swimmers and bathers. In addition, the new plan for the first time investigates the effects of stormwater plumes on the nearshore marine environment. Inland, the new monitoring plan has expanded to include bioassessment studies of creeks, along with the more consistent use of toxicity testing. Combined with the existing measurement of chemical parameters, this “triad” approach is intended to describe impacts more fully, more accurately identify their sources, and target follow-up studies and BMPs more effectively. Thus, the Third Term Permit monitoring program includes five key elements:

- Urban stream bioassessment monitoring
- Long-term mass loading monitoring
- Coastal storm drain outfall monitoring
- Ambient coastal receiving water monitoring
- Dry weather reconnaissance monitoring.

The overall monitoring approach and methods are summarized in the following sections.

C-11.3 Monitoring Approach

The objectives of the Receiving Waters Monitoring Program, as stated in Attachment B.1 of the Third Term Permit, are to:

- Assess compliance
- Measure the effectiveness of Urban Runoff Management Plans
- Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff
- Assess the overall health and evaluate long-term trends in receiving water quality.

The monitoring program meets these objectives (with the proviso that measuring the effectiveness of Urban Runoff Management Plans also requires the implementation of focused evaluations of best management practices (BMPs)) by continuing and expanding the Second Term Permit monitoring emphasis on assessing impacts on aquatic resources, documenting long-term trends in water quality, targeting problematic discharge sites for more focused monitoring, and adding additional monitoring elements. The objectives for each program element are as follows:

Urban stream bioassessment:	Using a “triad” of indicators (bioassessment, chemistry, toxicity), describe impacts on stream communities and the relationship of any impacts to runoff, based on comparisons with reference locations on a year-to-year time frame.
Long-term mass loading:	Using measurements of key pollutants, loads shall decline over a time frame of years to decades, as compared with past and present levels.
Coastal storm drains:	Using a suite of bacterial indicators at high priority drain outfalls, track compliance with regulatory standards and any improvements due to BMP implementation.
Coastal receiving waters:	Using measure of runoff plume characteristics and extent, as well as measures of a suite of physical, chemical, and biological indicators, improve understanding of the impacts of runoff plumes on nearshore ecosystems.
Dry weather reconnaissance:	Using data from both random and targeted sites, define background dry weather conditions as a basis for identifying candidate sites for further focused source identification work.

The monitoring program will reflect the Program's continued evolution toward watershed management. As discussed in the following sections, monitoring sites in the various program elements have been located in specific watersheds, with the goal of improving the ability to understand stormwater processes and manage their impacts in a more functional manner.

C-11.4 Description of Monitoring Procedures

C-11.4.1 Urban stream bioassessment

The Permittees with assistance of Regional Board staff have selected twelve channels and three reference sites to conduct urban stream bioassessments using California Stream Bioassessment Procedure (CSBP) established by the California Department of Fish and Game (DF&G). A contract laboratory conducts the bioassessment sampling and taxonomic analyses on behalf of the Permittees. A description of the CSBP can be found at http://www.dfg.ca.gov/cabw/cabw/professionals.PDF.

In order to conduct the triad analysis, at the time of bioassessment sampling the Permittees collected grab samples for chemical and toxicity analysis. The suite of chemical constituents is the same as analyzed in the Mass Emissions Program. The aqueous toxicity is evaluated using three freshwater organisms, Ceriodaphnia dubia, Selanastrum capricornutum, and Hyallela azteca.

C-11.4.2 Long-term mass loading

The Permittees selected six channels in the San Diego Region to conduct mass emissions monitoring. The selection criteria included the following:

- Classification of the waterbody as a "Water of the State" in the Water Quality Control Plan for the San Diego Region;
- Suitability of the site drainage area to monitor area-wide contributions of storm water pollutant loading;
- Suitability of the site's hydrological characteristics to enable practical measurement of flow and collection of representative storm water samples;
- Maintenance of long-term data collection at appropriate existing monitoring stations (Laguna Canyon Wash, Aliso Creek, San Juan Creek, Prima Deshecha Channel, and Segunda Deshecha Channel);
- Safety from traffic and other hazards;
- Suitable siting for sampling equipment; and

- Crew access for retrieving samples and maintaining equipment during storm conditions.

The Permittees used time-composite sampling as the primary method of monitoring the concentration and load of constituents at their Mass Emissions sites. This type of sampling is conducted with automatic samplers that consist of programmable pumps (peristaltic) which transport water from the channel to a collection reservoir in the autosampler base. The collection reservoir can be a single large composite bottle or a series of up to 24 bottles. The autosampler program can be modified to vary sample volumes and frequency of collection. In the San Diego Region two automatic samplers were used at each Mass Emissions site. One autosampler was used for monitoring water chemistry and the other was used for monitoring toxicity.

To collect samples for the analysis of water chemistry, 8, 1.8-liter glass bottles were used in the autosampler base. The water chemistry autosampler was programmed to collect three discrete samples per 1.8-liter bottle. To collect samples for toxicity testing, a single 5-gallon glass bottle was used in the autosampler base. The two samplers were programmed to collect at the same frequency to maintain the consistency between the composite samples produced by each.

Three storms were monitored at each Mass Emissions site. For each storm the water chemistry was monitored with a series of 3 to 5 composite samples collectively spanning approximately 96-hours. The sampling for toxicity testing was coincident with just one of these composite samples. The Permittees chose the following temporal segments of storms that would be monitored for toxicity.

- Storm 1 – first flush (first hour of storm);

- Storms 2 and 3 – 24-hour period beginning three hours after the initiation of the first flush sampling by the water chemistry autosampler.

During each storm the automatic sampling programs were initiated when the water level in the channel rose above a triggering device (level actuator or flowmeter) hardwired to the respective autosampler. When possible a single triggering device was used to trigger both samplers simultaneously. For the water chemistry sampler (and the toxicity sampler during the first storm) the frequency of collection during the first hour of a storm was set at 1 sample/12 minutes. After the sixth sample is collected at the one-hour mark, the collection frequency is decreased to once every 2 hours. Sampling of water chemistry spans approximately 96 hours to allow comparison of the data to 96-hour guidance criteria for chronic aquatic toxicity from the California Toxics Rule (CTR). The concentrations of dissolved heavy metals in the composite samples can be compared to acute toxicity criteria from the CTR. The concentrations of organophosphate pesticides can be compared to literature values of LC_{50}s for toxicity testing organisms.

Autosampler maintenance is performed periodically during the 96-hour period to change bottles, icepacks, and power supplies.

The first six samples collected during each storm were composited and represented the "first flush". The remaining bi-hourly storm samples were used to prepare composite samples that were representative of the subsequent parts of the storm. Unless a 24-hour composite sample was prepared for comparison to toxicity testing results, the samples beyond the first flush were composited using the stage hydrograph for the channel, or by evaluating the electrical conductivities of the samples in each bottle. Using hydrographs from the Principal Permittee's Automated Local Evaluation in Real Time (ALERT) system, samples collected beyond the first flush and representing the storm peak and recession were composited into a single sample. Storms spanning multiple days were broken up into two or more composite samples.

In the absence of a streamgauge hydrograph for the sampled channel, the conductivity of the samples from each bottle (in order of collection) was measured. Changes in conductivity usually denote the beginning or end of storm runoff. After the "first flush" of a storm, conductivities tend to immediately decrease during the rise of the storm hydrograph and slowly rise after the recession. Sample appearance (turbidity or fluvial sediment) can also be used in the compositing process. Storm samples tend to be more turbid and contain more fluvial sediment. Using these electroanalytical measurements and visual observations as a guide, composite samples were prepared to represent various parts of a storm.

Water chemistry samples were analyzed for pH, electrical conductivity, turbidity, nitrate, ammonia, total Kjehldahl Nitrogen (TKN), phosphate, orthophosphate, total suspended and settleable solids, volatile suspended solids, hardness, organophosphate pesticides, and total recoverable and dissolved copper, chromium, lead, cadmium, zinc, silver and nickel .

Samples for the analyses of dissolved metals were filtered with a 0.45 micron groundwater filtering capsule and then acidified with analytical grade nitric acid before submittal to the contract laboratory.

Toxicity of stormwater runoff samples were evaluated using three toxicity tests with marine organisms. The toxicity due to pesticides was measured using the mysid (Mysidopsis bahia) survival/growth test. The toxicity due to dissolved metals was measured using the sea urchin (Stronglyocentrotus purpuratus) fertilization and embryo development tests.

Time composite monitoring is supported by the Principal Permittee's precipitation and streamgaging network which consists of recording and/or transmitting ALERT gages. Mechanical recording raingages are weighing bucket type. Accumulated rainfall is recorded in analog format on drum charts. The ALERT precipitation gages are tipping bucket type with dataloggers. Data are recorded and transmitted in digital format; sensitivity is 1 mm (0.04 inches) of accumulated rainfall.

The Principal Permittee uses several types of streamgauges to monitor changes in water level. The oldest design is the stilling well with water level float; the newer types are manometer gages or pressure transducers. Data (water level versus time) are recorded on stripcharts. The ALERT interface to these gages consists of a connection from the recorder chart drive to an ALERT shaft encoder. ALERT information is recorded on a datalogger and transmitted to the Principal Permittee Katella yard base station in digital format. Sensitivity of the transmitted and recorded ALERT record is user-variable with the greatest sensitivity being a change in water level of 0.01 feet.

C-11.4.3 Coastal stormdrain outfall monitoring

The Permittees selected twenty-six coastal stormdrains to monitor the effects of urban runoff on the coastal zone. The following selection criteria were used:

- Outlet of the stormdrain is posted with a warning sign by the Orange County Health Care Agency;

- The stormdrain has an equivalent circular diameter greater than 39-inches or a daily dry-weather, discharge volume exceeding 100,000 gallons; and

- The stormdrain and the surfzone is accessible by monitoring staff.

Monitoring was conducted on both the discharge from the stormdrain and the surfzone 25 yards up-coast and 25 yards down-coast of the stormdrain-ocean interface. Grab samples were collected weekly for the analysis of total coliform, fecal coliform, and Enterococcus bacteria. An estimate of the flowrate from the stormdrain was made and the temperatures of the stormdrain discharge and the surfzone down-coast were measured.

The following criteria were established for monitoring:

- Samples were not collected on the day of rainfall;

- Samples were not collected from a stormdrain during the period when its discharge was diverted to a sanitation district; and

- During stormdrain diversion only a sample from the surfzone (down-coast of the stormdrain-ocean interface) was collected.

The following is a description of the methods used for grab-sample collection and flow estimation.

- Collecting the sample
  - The sample containers (120-ml plastic bottles) were provided by the contract laboratory. Each bottle contained a small amount of sodium thiosulfate as a preservative.
  - At each site, bacteriological sample bottles were filled using aseptic technique to avoid contaminating the sample. Samples were collected directly into the sample container to avoid cross-contamination from a transfer device. A fresh pair of powder-free disposable gloves was used at each site.
  - The bottles were labeled with a sample ID number prior to collecting the sample. The date, time, and sampler initials were recorded on a logsheet. Sampling staff also recorded any observations that may have an influence on the quality of the sample including animal or human activity in the area, animal feces, stormwater runoff, etc.
  - Samples from the stormdrain were collected a closely as possible to the center of the flow line. For wider channels a telescoping pole was used to collect the sample from the center. To avoid contamination by sediment at the bottom of the storm drain, samples were allowed to flow into the bottles rather than scooping the sample into the bottles. Surfzone samples were collected in ankle deep water. Sample bottles were filled to the bottle shoulder to allow space for mixing. After filling the bottles were carefully capped and placed in an ice-chest for transport to the laboratory.
  - The time from sample collection to delivery to the laboratory was kept below six hours.
- Temperature measurement was conducted with a calibrated thermometer
- Estimating the flowrate was conducted using one of the following methods:
  - Measuring the time required for a container of known volume to be filled by the discharge from the pipe or,
  - Measuring the cross-sectional area of water in the pipe or drain. If the diameter of the pipe is known the cross-sectional area in ft^2 is

$$Area = R^2 \arccos\frac{R-h}{R} - (R-h)\sqrt{2Rh-h^2}$$

    where R is the radius of the pipe, h is the depth of water (all in feet). This cross-sectional area was multiplied by the measured or estimated velocity (ft/sec) to determine the flowrate in ft^3/sec. The velocity was determined using one of the following methods.

- Using a Global Water Flow Probe, Marsh McBirney Flowmate, etc.

- Using the static stick method where the velocity of the water is calculated by $v=\sqrt{2gh}$ where v is the velocity in feet per second, h is the velocity head, and g is the acceleration due to gravity (32 ft/sec^2). Velocity head is the difference in the folding scale reading when measuring the depth with the wide edge perpendicular to the flow to that with the edge parallel to the flow. It is also known as the pile-up.

- Using the floating leaf method where the time required for a floating object to travel a known distance (e.g. 6 feet) is measured.

C-11.4.4 Ambient coastal receiving water monitoring

The monitoring of Ambient Coastal Receiving Waters will be used to evaluate the effect of urban runoff on the ecologically sensitive areas along the Southern Orange County coastline. The monitoring will be conducted in phases in order to establish a priority for future offshore monitoring projects. During the first year the monitoring consisted of sampling the discharges to these coastal areas. Grab samples were collected using similar methods described in the Coastal Stormdrain Section above. These grab-samples were analyzed for water chemistry and aqueous toxicity. The suite of water quality constituents measured and the types of toxicity tests conducted were identical to those used in the Mass Emissions Program (see above). Monitoring in the future will include aerial photography of the stormwater plumes from the coastal drains affecting these areas. The size of the plume in each area will be used in the matrix for prioritization.

Dana Point Harbor and Dana Cove are included in the Ambient Coastal Receiving Waters Program. During the second and subsequent years of the permit, monitoring in these areas will include assessments of sediment chemistry, sediment toxicity, and benthic infauna. On a semiannual schedule, benthic sediment will be collected to evaluate concentrations of copper, chromium, cadmium, lead, zinc, silver, nickel, chlorinated hydrocarbon and organophosphate pesticides, herbicides, PCBs, and Polynuclear Aromatic Hydrocarbons (PAHs). Sediment toxicity will be evaluated using the 10-day amphipod (Eohaustorius estuarius) survival test. Benthic infaunal analyses will be conducted using the methods developed by the Southern California Association of Marine Invertebrate Taxonomists (SCAMIT).

Benthic samples will be collected using a petite ponar dredge. Samples for benthic infaunal analyses will require five dredge samples per site to approximate the same sampling area used to establish the Regional Benthic Response Index (BRI).

C-11.4.5 Dry weather reconnaissance

The objectives of the Dry-Weather Monitoring Program are to determine the average condition of stormdrain discharges in the San Diego Region of the County, and to identify and eliminate illegal discharges and illicit connections (ID/ICs) to the stormdrain system.

To accomplish the first objective the Permittees established a set of 30 randomly selected stormdrains (random sites) in South Orange County. Each Permittee including the County of Orange has at least one random site within their respective jurisdiction. Each of these 30 sites will be sampled three times during the period from May 1 through September 30 of each year. The data from all of the samplings will be used to establish a database from which the average concentrations of each monitored constituent will be calculated. Monitoring at each site includes insitu measurements of turbidity, pH, temperature, specific conductance, and dissolved oxygen. Chemical measurements in the field include nitrate, ammonia, orthophosphate, total chlorine, phenol, MBAS (surfactants), and water hardness. Grab samples are collected for laboratory analyses of total suspended solids; total coliform, fecal coliform, and Enterococcus bacteria; oil and grease; dissolved metals; and organophosphate pesticides. Flowrate is estimated using the method described in the Coastal Stormdrain Outfall Program above.

In order to accomplish the second objective, the Permittees established a list of 26 "targeted" stormdrains in which ID/ICs were suspected. A statistical analysis of the data from the sampling of the random stormdrains will be used to establish the triggers for initiating reconnaissance for source identification in the watersheds of the targeted drains. The targeted drains will be sampled five times during the period between May 1 and September 30 of each year. Reconnaissance will be triggered if the results from two successive samplings at a random or targeted site exceed 3.9 standard deviations above the mean condition.

C-11.5 Methods of Data Analysis

C-11.5.1 Comparison to water quality guidance

Acute (CMC-Criteria Maximum Concentration) and chronic (CCC-Criteria Continuous Concentration) aquatic toxicity criteria from the CTR were used as guidance to evaluate dissolved metals data collected from storm channels and harbors. Water quality criteria from the CTR for both freshwater and saltwater are found in **Table C-11.1** and for sediment from other sources in **Table C-11.2**..

California Water Code Section 13170 authorizes the State Water Resources Control Board (SWRCB) to adopt water quality control plans for waters where standards are required by the Federal Clean Water Act (CWA) and its 1987 amendments, the Water Quality Act (WQA). According to Section 303(c)(2)(B) of the CWA, these plans must contain water quality objectives for priority pollutants that could be reasonably expected to affect the beneficial uses of the waters of the State.

On March 2, 2000, the State adopted the United States Environmental Protection Agency's (USEPA) Rules establishing numeric water quality criteria for priority toxic pollutants (commonly referred to as the CTR) for the State of California. The CTR sets criteria for dissolved heavy metals in freshwater that are based on water hardness and separate criteria for saltwater. The dissolved metals data were compared to the acute and chronic criteria for guidance purposes.

According to the CTR, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations. For waters with a hardness of over 400 mg/l as calcium carbonate, a hardness of 400 mg/l as calcium carbonate shall be used with a default Water-Effect Ratio (WER) of 1, or the actual hardness of the ambient surface water shall be used with a WER. For this reporting period the former method was used.

In applying the CTR criteria to freshwater, if the time period to which the guidance applies is less than the length of the sampled period, a measured concentration greater than that guidance value will constitute an exceedance. For example, if the 1-hour guidance for lead (at a hardness of 100 mg/L as $CaCO_3$) is 65 μg/L, a concentration of 68 μg/L during a 24-hour period will be considered an exceedance of the guidance criterion.

In computing the mean concentration during a sampled period with multiple composite samples, values below the detection limit were assumed to be zero. This assumption allows for a more consistent evaluation from year to year as detection limits are lowered with alternative methods of analysis or new technology. The assumption also gives greater confidence to a designation of an exceedance of a guidance criterion as it reduces the likelihood that the exceedance was caused by an erroneous estimation of a non-detected value. During this monitoring year the low detection limits achieved by the contract laboratory did not make this approach an issue except for a few instances where the calculated criterion for silver was lower than the detection limit of 2 μg/L.

With respect to the saltwater guidance from the CTR, the average concentrations of dissolved metals in depth-integrated samplings from each 4-day storm monitoring of the Harbors and Bays were compared to the 4-day guidance criteria. The dissolved metals concentrations in each grab sample were compared to the 1-hr acute toxicity guidance criteria. There is no chronic guidance criterion for silver so only the acute criterion was used. Since total chromium was analyzed only the criteria for trivalent chromium (Chromium III) were used.

C-11.5.2 Toxicity testing

Toxicity tests span varying time periods depending on the type of organism function (survival, growth, reproduction, etc.) being evaluated. Endpoint data are used to compute statistics that can be compared against regulatory criteria. These statistics include Acute Toxicity Units (TUa) and Chronic Toxicity Units (TUc).

The concentration that causes 50% mortality of the organisms (the median lethal concentration, or LC_{50}) is calculated from the data for 96 hours (96-hour acute LC_{50}) and for day seven (seven-day chronic LC_{50}) using USEPA methods. The LC_{50} values are point-estimates expressed as "percent sample;" the lower the LC_{50} percentage the more toxic the sample. For acute regulatory standards, the LC_{50} acute value is used. For chronic regulatory standards, the seven-day chronic effects are estimated using the NOEC, or No Observed Effect Concentration, for both survival and reproduction. This is the highest concentration tested in which there was no statistically significant effect on the survival or reproduction compared to the control response. The lower the NOEC, the more toxic the sample.

For purposes of assessment between sites or between samplings, the endpoints described above are transformed into toxic units (TU). Toxic units are further divided into toxic units acute (TUa) and toxic units chronic (TUc) for acute and chronic endpoints, respectively. As toxicity increases, the toxic units increase.

TUa and TUc values are calculated very differently and are not interchangeable or related. The TUa equals 100/96-hr acute LC_{50}. If the LC_{50} is greater than 100%, then the TUa is calculated by the following formula:

TUa = log(100-S)/1.7 where S = percentage of survival in 100% sample. If S > 99%, the TUa is reported as zero, which is the lowest TUa value possible. The percent survival in the 100% concentration used in this formula is expressed as a percentage of the control survival. The TUc equals 100/NOEC. The lowest TUc possible, which indicates no toxicity, is 1. TUc values were calculated separately for survival and reproduction endpoints.

For some tests, if the test data meet acceptability criteria, inhibition concentrations, an IC_{25} and an IC_{50}, are calculated. These are the concentrations that cause a 25 percent or 50 percent inhibition of an organism's function such as growth, or cell density, in the Selanastrum test.

A reference toxicant test is also run to establish whether the test organisms used fall within the normal range of sensitivity. The reference toxicant test is conducted with known concentrations of a given toxicant (e.g., copper sulfate is used for *Ceriodaphnia*). The effect on the survival and reproduction of the animals is compared to historical laboratory data for the test species and reference toxicant. If the values are within two standard deviations of the historical average, the test organisms are considered to fall within the normal range of sensitivity.

Standard operating procedures for each of the specific tests conducted for both marine and freshwater organisms are detailed in **Attachment C-11-I**.

C-11.5.3 Bioassessment and Index of Biotic Integrity (IBI)

A complete description of methods for calculating the Index of Biotic Integrity for each site is contained in the annual report of the bioassessment monitoring, posted on the Program's website at http://www.ocwatersheds.com/StormWater/swp_documents_intro.asp. In brief, each site is evaluated in terms of a series of metrics (**Table C-11.3**), which are then scored (**Table C-11.4**) to provide a basis for determining the IBI scores themselves for each site. These scoring ranges are based on data from the southern California region, from southern Monterey County to the Mexican border. The refined southern California IBI is more sensitive than the preliminary IBI, particularly for sites in the Good and Very Good range. The new scoring ranges differ from those used last year, which were based on data from San Diego County and reflect conditions in streams in that region. The use of the more broadly applicable IBI follows the California Department of Fish and Game protocol, which continues to evolve. In addition, the Stormwater Monitoring Coalition is undertaking a project to develop a further improved IBI, or set of IBIs, representative of conditions throughout the entire southern California region. Thus, the IBI scores presented here may continue to shift somewhat in the future.

C-11.5.4 Evaluation of triad data

Evaluation of triad data (i.e., bioassessment, water chemistry, toxicity) was based on the framework developed by the Stormwater Monitoring Coalition's Model Stormwater Monitoring committee. This approach, which will be described in detail in the report to be released by the SMC in January 2004, is based on a weight of evidence approach that compares each of the three legs of the triad against each other. **Table C-11.5**, drawn from the SMC's model stormwater monitoring program report, summarizes the types of conclusions that can be drawn from various combinations of triad results. Thus, there is no routine or standard method for evaluating triad data. However, the triad data from the bioassessment stations for the most part led to relatively clear interpretations of causal factors for observed conditions. Given that this is the first year of sampling for this program component, no evaluation of trends was possible.

C-11.5.5 Mass load calculations

Mass loads were calculated using chemical and hydrographic data. Water level records from streamgaging stations at or near the sampling site were processed using Western Hydrologic Software. Water levels from the station's continuous stripchart recorder were digitized and converted to discharge rates using stage-discharge relationships (channel ratings). The digitized streamflow record was converted to ASCII format and imported to a Microsoft Excel file. The total discharge in acre-feet during each sampled period was computed. By multiplying the total water discharge per sampled period by the pollutant concentration of the composite sample from the period and applying the proper conversion factors (acre-feet to lbs. of water), a mass load in pounds or tons of contaminant was calculated. For data reported as ND (non-detected), one-half of reported laboratory detection limits were used in the calculations.

Event mean pollutant concentrations were calculated to produce a site mean EMC that could be used in the estimation of the mass loads from unsampled storms. To calculate the EMC of a monitored storm the sum of the mass load from each composite sampling during a storm was divided by the total sampled volume of water during the same period. After applying the appropriate conversion factors, an event mean concentration in mg/L or □g/L was calculated. The site-mean EMCs were updated each year with the EMC data from that year.

Site mean EMCs were used to estimate mass loads from unsampled storms. To estimate these mass loads, the site mean EMC for a stormwater contaminant from a particular station was multiplied by the total annual volume of water discharged during unsampled storms, and the appropriate conversion factors. The site mean EMC was calculated from the set of calculated EMCs from each sampled storm from the beginning of the NPDES program. Only EMCs in which the 75-120% of the total storm runoff volume was sampled were used in the calculation. Each year the site means were updated with the data from that year.

The distribution of each EMC dataset was first evaluated for normality using the W Test developed by Shapiro and Wilk (1965). The W statistic was compared to a tabled value for a given value of α. To calculate W, the data from each station was first ordered from smallest to largest to obtain the sample order statistics $x_1 \leq x_2 \ldots \leq x_n$. k was then calculated from n where:

$$k = \frac{n}{2} \quad \text{if n is even or}$$

$$k = \frac{n-1}{2} \quad \text{if n is odd}$$

$$W = \frac{1}{d}\left[\sum_{i=1}^{k} a_i\left(x_{(n-i+1)} - x_i\right)\right]^2$$

where $$d = \sum_{i=1}^{n}(x_i - \bar{x})^2 = \sum_{i=1}^{n} x_i^2 - \frac{1}{n}\left(\sum_{i=1}^{n} x_i\right)^2$$

If the calculated W was less than the tabled value at the α (0.05) significance level, the null hypothesis was rejected and the distribution was considered normal. If the distribution was not normal at the α significance level the data was log-transformed and the W test was repeated to test for log-normality. If the distribution was not lognormal, the dataset was inspected for possible outliers. The Dixon test (for n < 25) was used to determine if the suspected points were outliers to a normal distribution. The procedure was performed as follows:

The dataset was ordered from smallest to largest that is $X_1 < X_2 < X_3 < \ldots X_n$. The Dixon ratio r, which is a function of n was calculated.

Number of Points	Ratio Calculated
n = 3 to 7	r_{10}
n = 8 to 10	r_{11}
n = 11 to 13	r_{21}
n = 14 to 25	r_{22}

Depending on which point was suspected of being the outlier, the ratio was calculated in the following manner:

r	If X_n is Suspect	If X_1 is Suspect
r_{10}	$(X_n-X_{n-1})/(X_n-X_1)$	$(X_2-X_1)/(X_n-X_1)$
r_{11}	$(X_n-X_{n-1})/(X_n-X_2)$	$(X_2-X_1)/(X_{n-1}-X_1)$
r_{21}	$(X_n-X_{n-2})/(X_n-X_2)$	$(X_3-X_1)/(X_{n-1}-X_1)$
r_{22}	$(X_n-X_{n-2})/X_n-X_3)$	$(X3-X_1)/X_{n-2}-X_1)$

The calculated ratio was compared to the critical value at a confidence level of 95%. If the calculated value was greater than the tabled value the suspected point was rejected and the distribution was retested to confirm normality.

For normal distributions the mean is calculated as the arithmetic mean, that is

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

the confidence limits for the mean of a normal distribution with unknown variance is given by

$$\bar{x} - t_{(1-\alpha/2,n-1)}\frac{s}{\sqrt{n}} \le \mu \le \bar{x} + t_{(1-\alpha/2,n-1)}\frac{s}{\sqrt{n}}$$

where s is the standard deviation of the dataset and $t_{(1-\alpha/2,n-1)}$ is from tabled values. Using $\alpha = 0.05$ the upper and lower limits are calculated. The true mean μ will occur outside of this range 5% of the time.

For lognormal distributions the arithmetic mean and standard deviation of the log-transformed data were first computed. The estimate of the mean is given by the minimum variance unbiased estimate □□ which is defined as

$$\mu_1 = [\exp(\bar{x})]\Psi_n\left(\frac{s^2}{2}\right)$$

where □$_n$(t) is the infinite series defined by

$$\Psi_n(t) = 1 + \frac{(n+1)t}{n} + \frac{(n+1)^3 t^2}{2!n^2(n+1)} + \frac{(n-1)^5 t^3}{3!n^3(n+1)(n+3)} + \frac{(n-1)^7 t^4}{4!n^4(n+1)(n+3)(n+5)} + \bullet\bullet\bullet$$

$\frac{s^2}{2}$ is substituted for t and values for □$_n$ are calculated using formulas in a Microsoft EXCEL 7.0 spreadsheet.

The lower confidence limit of the mean is given by

$$LL_\alpha = \exp\left(\bar{x} + 0.5s^2 + \frac{sH_\alpha}{\sqrt{n-1}}\right)$$

and the upper limit is given by

$$UL_{1-\alpha} = \exp\left(\bar{x} + 0.5s^2 + \frac{sH_{1-\alpha}}{\sqrt{n-1}}\right)$$

The sample median of each normal distribution was calculated by first ordering the sample population from smallest to largest.

sample median = $x_{(n-1)/2}$ if n is odd

= $\frac{1}{2}\left(x_{(n/2)} + x_{(n+2)/2}\right)$ if n is even

The true median of a lognormal distribution can be estimated by

$$M_2 = \exp(\bar{x})\Psi_n(t)$$

where $\Psi_n(t)$ is the infinite series described above. In this case the value of $t = -s^2/[2(n-1)]$.

C-11.5.6 Evaluation of coastal stormdrain and receiving water data

Coastal stormdrain data consist of temperature measurements and concentrations of bacterial indicators in the discharge and upstream and downstream of larger flowing stormdrains. Data analysis consisted simply of comparing indicator levels at each drain to the state's AB411 standards and documenting which drains were most persistently above the standards. Where possible, potential explanatory factors in the drainage area of such drains were considered. Given that this is the first year of sampling for this program component, no evaluation of trends was possible.

The ambient coastal receiving water data were compared to marine CTR values and ranked in terms of their relative degrees of contamination. In addition, toxicity test results were compared to chemistry samples to identify potential explanations for any observed toxicity. Subsequent analysis will involve a qualitative assessment of the receiving water environment around each discharge in terms of its ability to assimilate runoff, the presence of other sources of contamination, and the presence of sensitive marine resources. This information will be used to arrive at relative rankings of the degree of runoff risk to each site, which will then provide a basis for prioritizing further studies of stormwater plume extent and impact.

C-11.5.7 Prioritization of dry weather sites for source identification

Only a single sampling of the random dry weather sites was conducted during this monitoring year. Because two consecutive "hits" of elevated levels are required to identify a site for more intensive source identification work by the relevant city, it was not possible to carry out this prioritization analysis. Data for this single sampling event are simply reported and the highest 10% of values identified.

C-11.6 Analysis of Data

The following sections present data summaries and interpretations for each of the major monitoring program components.

C-11.6.1 Urban stream bioassessment

Tables C-11.6 and **C-11.7** present the IBI scores for each bioassessment monitoring site (**Table C-11.8**) in the fall 2003 and spring 2004 sampling periods. In both surveys, the urban affected sites in the study region had IBI ratings of Fair to Very Poor. The reference sites were all rated Good, with the exception of REF-CS, which was rated Fair in the fall 2003 survey and Poor in the spring 2004 survey. This site was also rated Fair in both surveys during the previous year.

While the IBI rating of several sites remained consistent across the two surveys, the rating for others shifted somewhat. In particular, the score for AC-PPD increased from 5 to 11 from the fall to the spring survey and the score for LC-133 dropped from 20 to 8, and for TC-AP from 25 to 5 in the same period. This was due, at AC-PPD, to decreases in the metrics for collector-filterers plus collector-gatherers, non-insect taxa, and tolerant taxa. For TC-AP, the lower score in the spring was due to negative changes across six out of seven metrics, and for LC-133, to increased numbers of non-insect and tolerant taxa. There was a substantial amount of construction upstream of both these stations, which may account for their reduced IBI scores.

With only one exception (CC-CR in both surveys), all of the non-reference sites were rated either Poor or Very Poor. In general, the IBI rankings primarily reflect the degree of habitat modification due to watershed urbanization. **Figure C-11.2** shows that, despite some variation from one survey to the next, stations are relatively consistent in terms of their overall IBI rank. (This figure was produced using recalculated IBI scores from earlier surveys, to ensure that all scores reflected a consistent scoring methodology.) Overall, stations further downstream tend to have lower IBI scores than stations further upstream, which reflects the pattern of development with denser development closer to the coast.

Toxicity data (**Table C-11.9**), from both the fall 2003 and spring 2004 sampling period, show that toxicity is restricted to the chronic Ceriodaphnia reproduction test at five sites in the fall (ACJ01, AC-PPD, EC-MD, SC-MB, and REF-TCAS) and one site in the spring (SD-AP). While this is an increase over the June 2003 sampling in the number of sites with toxicity, the overall level of toxicity is much lower. Thus, two sites in the June 2003 survey had a level of 8 toxic units, none of the sites in this year's surveys exceeded 2 toxic units (see **Table C-11.10** for a summary of the June 2003 toxicity results). This reduced level of toxicity may be due, at least in part, to the lower overall level of rainfall, and therefore runoff, during the 2003-2004 rain year (**Figure C-11.3**).

There is some relationship between the observed pattern of toxicity and the water chemistry results at the sites with elevated toxicity. Sites ACJ01, AC-PPD, EC-MD, and SC-MB all had somewhat elevated levels of diazinon in fall 2003 (**Table C-11.11**), although all were well below the commonly accepted literature value for LC_{50} of 450 ng/l. Given that observed toxicity was restricted to the Ceriodaphnia test, and the fact that Ceriodaphnia is primarily sensitive to organophosphate pesticides (such as diazinon), but not to metals or high conductance, it is likely that toxicity is due at least partly to diazinon.

However, the relationship between water chemistry results for diazinon (the pesticide found in the highest concentrations) and toxicity is not always clear. For example, station SC-MB in the spring 2004 survey had elevated diazinon but no apparent toxicity. Similarly, station SD-AP in the spring 2004 survey had somewhat elevated toxicity, but no measurable diazinon. None of the stations had metals values that exceeded the freshwater CTR criterion, nor were there high values of conductance, except at the Segunda Deshecha station (SD-AP) (Previous Program studies have shown that the high conductance in both Prima and Segunda Deshecha is due to natural groundwater seeps in the channel walls.) It is likely that some unknown toxicant was responsible for the observed toxicity in such cases. The potential zinc contamination problem with the metals samples from this Program component precluded an analysis of any relationship between toxicity and zinc.

Viewed overall, there is general agreement among the three legs of the triad. Of the four stations that displayed some toxicity in the fall 2003 survey, three had the lowest IBI scores and the fourth (ACJ01) was only very slightly higher (**Table C-11.6**, **Figure C-11.4**). Similarly, the station with some toxicity in the spring 2004 survey (SD-AP) had an IBI score ranked near the bottom (**Table C-11.7**, **Figure C-11.5**). While the absence of toxicity in two out of the three organisms, the absence of toxicity at other stations with low IBI scores, and the generally low levels of toxicity observed, combine to strongly suggest that toxicity alone is responsible for the low IBI scores, it is consistent with a pattern in which stations in more urbanized watersheds and exposed to greater degrees of urban runoff showed greater impacts for all three types of data. If these results are confirmed in subsequent sampling periods, then they would begin to trigger the adaptive special studies (e.g., toxicity identification evaluations (TIEs), upstream source identification, evaluations of physical habitat disturbance) called for in the program design.

C-11.6.2 Long-term mass loading

Water chemistry data from mass emissions stations were used to calculate loads and to assess water quality with respect to applicable acute and chronic toxicity criteria from the CTR. Given that this is only the second year of the current monitoring program, and that mass loads estimates were available for only three (Trabuco Creek, San Juan Creek, and Aliso Creek) of the six mass loading stations during the program's first year, the program does not yet have the ability to describe and track longer-term trends in loads at the six mass loading stations. The accuracy of mass emission calculations was affected by several factors. The U.S. Geological Survey, which operates two streamgauges used in this program (San Juan Creek and Trabuco Creek) provides only provisional data during the program's normal reporting period. The streamgauge on lower Aliso Creek has only been in operation for two years and the upper end of the channel rating has not fully been defined. The streamgauge on Segunda Deshecha Channel was removed for two years during channel reconstruction. It has been re-installed for the 2004-05 season.

Table C-11.12 contains the measured stormwater mass loads of nutrients and metals at San Juan, Trabuco, and Aliso Creek Channels. The corresponding flow-weighted event mean concentrations of these constituents were calculated and are presented in **Table C-11.13**. The concentrations of dissolved metals in each composite sample collected in the Mass Emissions program element were compared to the acute toxicity criteria from the CTR. **Attachment C-11-II** presents all of these data highlighting those which exceeded the criteria. **Attachment C-11-III** shows the time-weighted event mean concentrations of dissolved metals that were compared to the chronic toxicity criteria from the CTR. **Table C-11.14** is a summary of the comparisons to the CTR criteria. Exceedances of the freshwater criteria were infrequent with only 1 of 57 samples exceeding the acute copper and zinc criteria. The chronic toxicity criteria for cadmium in freshwater were exceeded in each of the three sampled storms at Prima Deshecha Channel (PDCM01). The acute toxicity criterion for dissolved copper in saltwater was exceeded most frequently with 44 of 57 samples showing concentrations higher than the criterion. Prima Deshecha Channel showed the greatest number of exceedances of CTR criteria for saltwater.

The toxicity results (**Table C-11.15**) show substantial toxicity (8 toxic units or above) at only one station, PDCM01, during the February 18, 2004 storm. Elevated toxicity (4 toxic units or above) occurred on three other occasions, at the PDCM01 station during the November 1, 2003 storm and at the TCOL02 station during the November 1, 2003 and February 18, 2004 storms. This toxicity was evident only for the sea urchin fertilization test. A lower level of toxicity, never exceeding two toxic units, was observed for the sea urchin development test. No toxicity was observed for the mysid test.

Compared to the first year (2002-2003) of the program:

- The overall level of toxicity was lower, with one occurrence of substantial (8 toxic units or above) and three of elevated (4 toxic units or above) toxicity, compared to eight instances of substantial toxicity and nine others of elevated toxicity during the preceding year.

The lower level of toxicity may have been due to lower rainfall during the 2003-2004 rain year (**Figure C-11.3**).

Attachment C-11.IV graphically shows the relationship between the relative amounts of rainfall and toxicity during storm sampling for this year and last.

<u>C-11.6.3 Coastal stormdrain outfall monitoring</u>

Coastal stormdrain monitoring took place at the sites listed in **Table C-11.16**. The results of the coastal stormdrain outfall monitoring are presented in **Attachment C-11-V**, with exceedances of the AB411 standards in the surfzone highlighted in bold. The data do display substantial differences between stations in their relative frequency of exceedances of the AB411 single-sample standards, which are:

- Total coliforms: 10,000 cfu / 100 ml
- Fecal coliforms: 400 cfu / 100 ml
- Enterococcus: 104 cfu / 100 ml.

There were fifteen drains that exceeded AB411 standards on more than five dates and the pattern of exceedances for these drains is shown in **Table C-11.17**. Exceedances were predominantly for Enterococcus and there were virtually no exceedances of the total coliform standard in the entire dataset. Exceedances were usually, but not always, associated with clearly elevated levels in the stormdrain itself (**Figure C-11.6**, **Attachment C-11-V**). **Figure C-11.6** provides a detailed graphic illustration of the relationship between indicator concentrations in the stormdrain itself and in the receiving water. The figure is divided into segments that represent different likely conclusions about the extent to which the stormdrain discharge is causing elevated indicator levels in the receiving water. **Table C-11.18** provides a qualitative summary of the detailed data in **Figure C-11.6**, showing the two drains, SCM1(Salt Creek) and POCHE (Prima Deschecha Channel), that consistently affect the nearby receiving water in the dry season (when the AB411 standards apply).

There was no consistent overall pattern in which exceedances occurred in both the upcoast and downcoast direction on the same date (**Attachment C-11-V**). Exceedances at these drains were sometimes, but not usually, associated with antecedent rainfall.

C-11.6.4 Ambient coastal receiving water monitoring

The ambient coastal receiving water program component included both toxicity testing (with marine test organisms) and chemical sampling. **Table C-11.19** presents the aqueous toxicity testing results, **Table C-11.20** the overall chemistry results, with exceedances of the CTR highlighted, and **Table C-11.21** a summary of the numbers of acute CTR exceedances at each sampling station. Toxicity tests were performed using the same marine test organisms as used for the long-term mass loading component.

Overall, the data show that no stations had substantial toxicity, as defined in the previous year's analysis (8 toxic units or above) in the sea urchin test. Only two stations showed elevated toxicity of 4 toxic units or above, and this elevated toxicity occurred only once at each station:

- ACM-1 Aliso Creek Mouth north of PCH entrance
- DAPTDC Dana Point Harbour near drain from Ocean Institute parking lot

At ACM-1 on the date toxicity was present, copper was slightly above the CTR chronic criterion and diazinon was also somewhat elevated (123 ng/l), though far below the generally accepted LC_{50} of 450 ng/l. At DAPTDC, there were no elevated levels of dissolved metals, and no available pesticide data, on the date toxicity was present. In addition, other pesticides (e.g., chlorpyrifos, dimethoate, malathion) were always below detection limit, except for persistent occurrences of diazinon and malathion at the SCM-1 (Salt Creek Mouth) and SJC-1 (San Juan Creek Mouth) stations. While the Program (Dry Weather Reconnaissance element) has identified the stormdrain that is the likely source of contamination at Salt Creek, and the City of Laguna Niguel has conducted follow-up efforts upstream, there is no obvious source of contamination at San Juan Creek.

Compared to the first year (2002-2003) of the program:

- The overall level of toxicity was lower, with two stations showing elevated toxicity, as compared to five in the preceding year, and with the level of toxicity much reduced
- The overall level of metals CTR exceedances was almost identical, for both chronic and acute criteria, with nearly all exceedances related to dissolved copper

- The average level of dissolved copper decreased, with the mean concentration of samples exceeding the chronic criterion in 2004 being 9.3 µg/l compared to 19.5 µg/l last year
- Fewer stations showed exceedances of the acute copper criterion, with five stations exceeding the criterion this year compared to 12 last year.

The lower level of toxicity may have been due to lower rainfall during the 2003-2004 rain year (**Figure C-11.3**).

C-11.6.5 Dry weather reconnaissance

The dry weather period (May 1 – September 30) does not precisely match the Program's reporting period (July 1 – June 30). Because the reconnaissance monitoring design was intended to present a picture of contamination patterns through an entire dry season, the results summarized here include data from the early portion (May 1 – June 30) of the 2003 dry season, even though these data are technically from the preceding reporting period. **Attachment C-11-VI** contains the data used in this analysis.

The dry weather design includes both random and targeted sites. The purpose of the random sites is to define an average background condition in urban stormdrains. The purpose of the targeted sites is to focus specifically on stormdrains and/or locations known or thought to be sources of urban pollutants. A site (either random or targeted) was classified as problematic only when a pollutant was outside a tolerance interval (calculated from the entire set of random sites) or a control chart bound (calculated from the history of data at each site) on two consecutive sampling periods.

In general, the random sites met this criterion to a much lesser extent than did the targeted sites, a confirmation that the targeted sites were successful in focusing on problem areas. There were only four instances in which a random site was outside the tolerance interval on consecutive sampling dates for the same pollutant, while this occurred 19 times at the targeted sites (**Table C-11.22**). There were no instances in which data points exceeded either the Shewart or CUSUM control chart bounds on consecutive sampling events.

The random sites present a picture of the urban background conditions in the south County. For example, **Figure C-11.7** shows the spread of data values for the constituents ammonia as N, Chlorpyrifos, copper, Diazinon, dissolved oxygen, and reactive phosphorus as P. These data will be extremely helpful in characterizing background variability in urban conditions and providing a basis for identifying spatial patterns and tracking trends over time.

Similarly, plots of data from those stations where specific parameters exceeded the tolerance intervals on consecutive sampling events provide useful information about the nature and persistence of such elevated levels (**Figure C-11.8**). This information will be used to help characterize the behavior of potential sources of contamination and to assess the effectiveness of upstream source control measures implemented by the respective permittees.

C-11-6.6 Dana Point Harbor Monitoring

Monitoring at Dana Point Harbor was based on the Triad approach, and included benthic infaunal, toxicity, and sediment chemistry analyses. **Table C-11.23** shows the sediment chemistry and sediment toxicity testing results and **Table C-11.24** the benthic infauna community analysis.

Table C-11.23 shows that there were no data values that exceeded the NOAA Effects Range Median (ERM) concentration. However, copper and zinc were consistently enriched at all stations and sampling times, while lead and cadmium were only rarely so. **Figure C-11.9** illustrates the Dana Point sediment toxicity results and puts them in the larger context of other harbors and estuaries in the region. Toxicity was consistently highest at DAPTEB, and this station had the greatest number of enriched metals in the sediment, although copper was higher at other stations. Overall, sediment toxicity at Dana Point Harbor is the highest in the region (**Figure C-11.9**), which is not surprising, given that the stations (except for DAPTLB) were all intentionally sited adjacent to stormdrain discharges.

The benthic infaunal analysis (**Table C-11.24**) shows that all stations, with the exception of DAPTDC in November, had a Benthic Response Index (BRI) value of Level I or II, which indicated some level of disturbance. Level I in the BRI is equivalent to a loss of diversity of less than 25%, which is interpreted as some loss of biodiversity, but no clear evidence of disturbance. Level II is equivalent to a loss of biodiversity of between 25% and 50%, which is interpreted as clear evidence of disturbance, but not a major impact. This finding is not surprising, given that all stations were intentionally sited adjacent to stormdrain discharges.

Overall, there is a rough correspondence between the toxicity testing results and the BRI scores. The three instances with BRI scores of Reference or Level I had relatively lower toxicity, while site DAPTEB, with BRI scores of Level II had the highest toxicity. However, this relationship is not consistent and linear. For example, station DAPTBY had a BRI score in May of Level II but a relatively low toxicity. Similarly, station DAPTDC had the best BRI scores and the lowest levels of sediment copper (perhaps due to the higher than average levels of sand and rock in the sediment at that station), but there was not a consistent relationship between sediment chemistry, toxicity, and BRI scores for other stations. This suggests that effects on the benthic infaunal community may not be driven by sediment toxicity, but by other factors such as physical disturbance. It also suggests that simple sediment chemistry values do not reliably predict potential toxicity. These relationships are currently under investigation as part of the State Water Resources Control Board's Sediment Quality Objectives project. The findings and guidance from that effort will be applied by the Program as they become available.

C-11.6.7 Additional toxicity analyses

Past interpretations of toxicity testing results have depended in part on subjective comparisons of the observed toxicity to chemistry results. In some cases, more rigorous TIE (toxicity identification evaluation) studies can provide more detailed insight into the specific chemical compounds contributing to observed toxicity. TIE's can be problematic, however, because their cost and the logistics involved in performing them preclude carrying them out in all instances. The Program has therefore begun investigating the utility of an intermediate data analysis approach that may provide more information about the relative contribution of specific chemicals to the observed level of toxicity.

This approach is illustrated in **Figure C-11.10**, which presents data from the Prima Deshecha for a storm in November 2003. The figure shows the level of toxicity observed in the sea urchin fertilization test, which is sensitive predominantly to dissolved metals, and the mysid survival test, which is sensititive primarily to pesticides. For each category of pollutant, the predicted toxicity was calculated as described in the figure. Assuming that the predicted toxicity is relatively accurate, this analysis can be used to help decide whether there is substantial unexplained toxicity is persistently present, in which case a TIE may be called for. This is the case in **Figure C-11.10**, where the predicted toxicity from pesticides is much lower than that observed in the mysid survival test. This may be explained by unanalyzed toxicants such as carbamates and pyrethroids, which are also toxic to mysids. The dissolved metals illustrate the opposite situation, where the predicted toxicity is much higher than that observed. This may be due to the formation of organic ligand - metal complexes which are soluble but not bioavailable.

The Program's preliminary investigation of this approach, illustrated here, suggests it is worth further examination of its utility. More routine application of this method would depend on an investigation of its reliability in a range of different circumstances. Research such as this is being conducted elsewhere and this should provide further guidance for the Program's use of this method.

C-11.7 Quality Assurance / Quality Control

The quality of data produced by each of the three contractor laboratories was evaluated by submitting quality control samples with environmental samples. Most of the samples submitted were synthetic, comprised of aliquots of prepared standard solutions in nanopure water matrices. Quality Control sample conductivities were adjusted to levels similar to environmental samples with Ultrex grade sodium chloride. These synthetic samples were used to assess the accuracy of each laboratory. Replicate samples were also submitted to evaluate the precision of the laboratories.

The contractor laboratories conduct internal quality control programs utilizing certified reference materials (CRMs), spiked and replicate samples.

The results of the quality assurance program with the contract laboratory are summarized in **Attachment C-11-VII**. The allowable range of percent recovery for synthetic and samples is set at 70 - 130 for concentrations above 5 times the detection limit. For replicate samples in which the highest reported value exceeded 5 times the detection limit, the allowable range was set at 75-125 percent. For blank sample analyses the allowable range was the detection limit (dl) to 3(dl). Those results outside these ranges are boxed in the Attachment.

Generally, the analytical performance of each laboratory was acceptable. Only three of 51 total analyses in the nutrient group results outside acceptable range of recovery. These consisted of one analysis for ammonia, one for TKN, and one for total phosphate.

All analyses for of synthetic quality assurance samples for metals were within acceptable criteria. A zinc contamination problem was discovered when analyzing the total and dissolved metals data. Several pairs of dissolved and total recoverable zinc data showed higher dissolved than total recoverable concentrations. The source of the contamination appears to be the glass fiber filters used to process the samples. This contamination was not observed in the data where groundwater filtering capsules were used to process the samples. Zinc data from the Ambient Coastal Receiving Waters, Bioassessment, and Dry-weather Reconnaissance elements were most affected by this apparent contamination.

Equipment blanks will be submitted to determine if the contamination is consistent or limited to one particular lot of glass fiber filters.

C-11.8 Summary

The second year of monitoring under the Third Term Permit has expanded the information available for regional and watershed assessment of receiving water conditions and potential impacts on these from urban runoff. The expanded scope of the monitoring program encompasses not only inland creeks and streams but coastal receiving waters as well.

The monitoring data reviewed above begin to build a picture of year to year variability in conditions, as well as highlighting specific locations of potential concern. Certain pollutants have been identified as being possibly related to receiving water indicators such as toxicity and/or low community integrity scores. It is important to emphasize, however, that the monitoring program design includes key adaptive features that allow for more targeted investigations of potential impacts such as these. When and where data from subsequent monitoring confirms these patterns, additional effort may be focused on identifying the source(s) of such impacts and assessing the effectiveness of actions to reduce them.

Table C-11.1 Applicable Water Quality Guidance for the Protection of Aquatic Life

Water Quality Measurement	California Toxics Rule (CTR) Freshwater dissolved metals H=ln(water hardness in mg/L as $CaCO_3$)	CTR Saltwater Dissolved metals	Ocean Plan Toxic Mat. Limits Total metals	Region 8/9 Basin Plans
Lead ug/L H=ln Hardness	4 day =[1.462-0.146H][exp(1.273H-4.705)] 1 hour =[1.462-0.146H][exp(1.273H-1.460)]	4day = 8.1 1hr = 210	Daily max = 8 Inst. max = 20	
Cadmium ug/L	4 day = [1.107-0.042H][exp(0.7852H-2.715)] 1 hour = [1.137-0.042H][exp(1.128H-3.6867)]	4day = 9.3 1hr =42	Daily max = 4 Inst. max = 10	
Hexavalent Chromium ug/L		4day = 50 1hr = 1100	Daily max = 8 Inst. max = 20	
Nickel ug/L	4 day = 0.997[exp(0.846H+0.0584)] 1 hour = 0.998[exp(0.846H + 2.255)]	4day = 8.2 1hr = 74	Daily max = 60 Inst. max = 150	
Copper ug/L	4 day = 0.96[exp(0.8545H-1.702)] 1 hour = 0.96[exp(0.9422H-1.70)]	4day = 3.1 1hr = 4.8	Daily max = 12 Inst. max = 30	
Silver ug/L	1 hour = 0.85[exp(1.72H-6.52)]	1hr = 1.9	Daily max = 2.8 Inst. max = 7	
Zinc ug/L	4 day = 0.986[exp(0.8473H+0.884)] 1 hour = 0.978[exp(0.8473H+0.884)]	4 day = 81 1 hr = 90	Daily max = 80 Inst. max = 200	
Turbidity				Natural — Max. increase 0-50 NTU — 20% over natural 50-100 NTU — 10 NTU >100 NTU — 10% over natural
pH				6.5 - 8.5 freshwater 7.0 - 9.0 saltwater (SDR) 7.0 - 8.5 saltwater (SAR)
Dissolved Oxygen				>5.0 mg/L MAR & WARM >6.0 mg/L COLD
Unionized Ammonia*				0.025 in receiving waters

$$\text{* [Unionized Ammonia]} = \frac{[NH_3\text{-}N]}{10^{(pka-pH)} + 1}$$

$$\text{where } pka = 0.09018 + \frac{2729.92}{T}$$

NH_3-N = Total Ammonia as N
T = water temperature in Kelvin (C + 273.16)
pH = water pH

For example : at 20 C and pH 8.0 divide the ammonia nitrogen value by 26.25 to obtain unionized ammonia.
at 25 C and pH 9.0 divide by 2.76.

Table C-11.2 Applicable Sediment Quality Guidelines for the Protection of Aquatic Life

NOAA's Screening Concentrations

Metals (ppm)	ER-L	ER-M
Cadmium	1.2	9.6
Chromium	81	370
Copper	34	270
Lead	46.7	218
Nickel	20.9	51.6
Silver	1.0	3.7
Zinc	150	410
Organics (ppb)		
Acenaphthene	16	500
Acenaphthylene	44	640
Anthracene	85.3	1100
Fluorene	19	540
2-Methyl naphthalene	70	670
Naphthalene	160	2100
Phenanthrene	240	1500
Low molecular weight PAH	552	3160
Benzo(a)anthracene	261	1600
Benzo(a)pyrene	430	1600
Chrysene	384	2800
Dibenzo(a,h)anthracene	63.4	260
Fluoranthene	600	5100
Pyrene	665	2600
High molecular weight PAH	1700	9600
Total PAH	4022	44792
Chlordane	0.05	6
p,p' –DDD	2	20
p,p' –DDE	2.2	27
p,p' –DDT	1	7
Total DDT	1.58	46.1
Dieldrin	0.02	8.0
Total PCBs	22.7	180

ER-L - Effects Range Low

The ERL represents the concentration corresponding to the 10th percentile in toxicity testing. No effects are likely below the ER-L.

ER-M - Effects Range Median

The ERM represents the concentration corresponding to the 50th percentile or median value. Effects are likely above the ER-M.

SCCWRP Iron Normalization Regression Coefficients

Iron (% dry) Versus	Sample Size	r^2	Slope (m)	Intercept (b)	± 99% Prediction Interval
Cadmium (mg/dry g)	83	0.734	0.0978	0.0055	0.1274
Chromium (mg/dry g)	88	0.882	16.50	-0.021	11.56
Copper (mg/dry g)	96	0.833	7.40	-2.01	6.50
Lead (mg/dry g)	103	0.738	4.350	0.0836	5.199
Nickel (mg/dry g)	110	0.533	9.850	-0.407	19.596
Silver (mg/dry g)	99	0.581	0.0795	-0.0183	0.1426
Zinc (mg/dry g)	88	0.967	31.50	-1.95	15.45

Table C-11.3. IBI Metrics Used to Characterize Communities

Metric	Description	Response to Impairment
Richness Measures		
Taxa Richness	Total number of individual taxa	Decrease
EPT Taxa	Number of taxa in the Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) insect orders	Decrease
Coleoptera Taxa	Number of taxa in the insect order (Coleoptera, beetles)	Decrease
Dipteran Taxa	Number of taxa in the insect order (Diptera, “true flies”)	Increase
Non-Insect Taxa	Number of non-insect taxa	Increase
Composition Measures		
EPT Index	Percent composition of mayfly, stonefly, and caddisfly larvae	Decrease
Sensitive EPT Index	Percent composition of mayfly, stonefly, and caddisfly larvae with tolerance values between 0 and 3	Decrease
Shannon Diversity Index	General measure of sample diversity that incorporates richness and evenness (Shannon and Weaver 1963)	Decrease
Tolerance/Intolerance Measures		
Tolerance Value	Value between 0 and 10 weighted for abundance of individuals designated as pollution tolerant (higher values) or intolerant (lower values)	Increase
Percent Dominant Taxa	Percent composition of the single most abundant taxon	Increase
Percent Chironomidae	Percent composition of the tolerant dipteran family Chironomidae	Increase
Percent Intolerant Organisms	Percent of organisms in sample that are highly intolerant to impairment as indicated by a tolerance value of 0, 1 or 2	Decrease
Percent Tolerant Organisms	Percent of organisms in sample that are highly tolerant to impairment as indicated by a tolerance value of 8, 9 or 10	Increase
Functional Feeding Groups (FFG)		
Percent Collector-Gatherers	Percent of macrobenthos that collect or gather fine particulate matter	Increase
Percent Collector-Filterers	Percent of macrobenthos that filter fine particulate matter	Increase
Percent Scrapers	Percent of macrobenthos that graze upon periphyton	Increase
Percent Predators	Percent of macrobenthos that feed on other organisms	Variable
Percent Shredders	Percent of macrobenthos that shreds coarse particulate matter	Decrease
Percent Other	Percent of macrobenthos that are parasites, macrophyte herbivores, piercer herbivores, omnivores, and xylophages	Variable
Abundance		
Estimated Abundance	Estimated number of BMIs in sample calculated by extrapolating from the proportion of organisms counted in the subsample	Variable

Table C-11.4 IBI. Scoring Ranges for the Seven Metrics Included in the IBI Values

Index of Biotic Integrity Scoring Ranges.

Metric Score	Number Coleoptera Taxa	Number EPT Taxa		Number Predator Taxa	Percent CF+CG Individuals		Percent Intolerant Individuals		Percent Non-Insect Taxa	Percent Tolerant Taxa
	All Sites	Region 6	Region 8	All Sites	Region 6	Region 8	Region 6	Region 8	All Sites	All Sites
10	>5	>17	>18	>12	0-59	0-39	25-100	42-100	0-8	0-4
9		16-17	17-18	12	60-63	40-46	23-24	37-41	9-12	5-8
8	5	15	16	11	64-67	47-52	21-22	32-36	13-17	9-12
7	4	13-14	14-15	10	68-71	53-58	19-20	27-31	18-21	13-16
6		11-12	13	9	72-75	59-64	16-18	23-26	22-25	17-19
5	3	9-10	11-12	8	76-80	65-70	13-15	19-22	26-29	20-22
4	2	7-8	10	7	81-84	71-76	10-12	14-18	30-34	23-25
3		5-6	8-9	6	85-88	77-82	7-9	10-13	35-38	26-29
2	1	4	7	5	89-92	83-88	4-6	6-9	39-42	30-33
1		2-3	5-6	4	93-96	89-94	1-3	2-5	43-46	34-37
0	0	0-1	0-4	0-3	97-100	95-100	0	0-1	47-100	38-100
Very Poor: 0-13 Poor: 14-26 Fair: 27-40 Good: 41-55 Very Good: 56-70										

CF+CG: collector filterers plus collector gatherers

Table C-11.5. Decision framework for interpreting triad results

	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Possible Actions or Decisions
1.	Exceedance of water quality objectives	Evidence of toxicity	Indications of alteration	Strong evidence of pollution-induced degradation	Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority
2.	No persistent exceedances of water quality objectives	No evidence of toxicity	No indications of alteration	No evidence of current pollution-induced degradation Potentially harmful pollutants not yet concentrated enough to cause visible impact	No immediate action necessary Conduct periodic broad scans for new and/or potentially harmful pollutants
3.	Exceedance of water quality objectives	No evidence of toxicity	No indications of alteration	Contaminants are not bioavailable Test organisms not sensitive to problem pollutants	TIE would not provide useful information with no evidence of toxicity Continue monitoring for toxic and benthic impacts Initiate upstream source identification as a low priority Consider whether different or additional test organisms should be evaluated
4.	No persistent exceedances of water quality objectives	Evidence of toxicity	No indications of alteration	Unmeasured contaminant(s) or conditions have the potential to cause degradation Pollutant causing toxicity at very low levels	Recheck chemical analyses; verify toxicity test results Consider additional advanced chemical analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
5.	No persistent exceedances of water quality objectives	No evidence of toxicity	Indications of alteration	Alteration may not be due to toxic contamination Test organisms not sensitive to problem pollutants	No action necessary due to toxic chemicals Initiate upstream source identification (for physical sources) as a high priority Consider whether different or additional test organisms should be evaluated

	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Possible Actions or Decisions
6.	Exceedance of water quality objectives	Evidence of toxicity	No indications of alteration	Toxic contaminants are bioavailable, but in situ effects are not demonstrable Benthic analysis not sensitive enough to detect impact Potentially harmful pollutants not yet concentrated enough to change community	Determine if chemical and toxicity tests indicate persistent degradation Recheck benthic analyses; consider additional data analyses If recheck indicates benthic alteration, perform TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority If recheck shows no effect, use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
7.	No persistent exceedances of water quality objectives	Evidence of toxicity	Indications of alteration	Unmeasured toxic contaminants are causing degradation Pollutant causing toxicity at very low levels Benthic impact due to habitat disturbance, not toxicity	Recheck chemical analyses and consider additional advanced analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority Consider potential role of physical habitat disturbance
8.	Exceedance of water quality objectives	No evidence of toxicity	Indications of alteration	Test organisms not sensitive to problem pollutants Benthic impact due to habitat disturbance, not toxicity	TIE would not provide useful information with no evidence of toxicity Initiate upstream source identification as a high priority Consider whether different or additional test organisms should be evaluated Consider potential role of physical habitat disturbance

Table C-11.6. Index of Biotic Integrity Scores for Fall 2003

Reach	Total IBI Score	IBI Rating	% CF+CG		% Non-Insect Taxa		% Tolerant Taxa		Coleoptera Taxa		Predator Taxa		% Intolerant Individuals		EPT Taxa	
			Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score
REF-TCAS	49	Good	55%	9	21%	6	18%	6	5	8	9	6	23%	7	13	7
REF-SVC	44	Good	57%	8	24%	6	15%	7	2	4	10	7	19%	6	12	6
REF-CS	34	Fair	60%	8	23%	6	14%	7	4	7	5	2	1%	0	8	4
CC-CR	27	Fair	69%	6	21%	6	24%	4	1	2	7	4	0%	0	9	5
TC-AP	25	Poor	47%	10	40%	2	22%	5	1	2	7	4	0%	0	4	2
LC-133	20	Poor	72%	5	29%	5	17%	6	0	0	5	2	0%	0	3	2
SD-AP	17	Poor	41%	10	40%	2	33%	1	0	0	6	3	0%	0	2	1
SJC-74	16	Poor	60%	8	43%	1	25%	4	0	0	5	2	0%	0	2	1
TC-DO	12	Very Poor	56%	8	44%	1	36%	0	1	2	3	0	0%	0	2	1
ACJ01	6	Very Poor	97%	0	39%	2	30%	2	0	0	2	0	0%	0	3	2
SJC-CC	6	Very Poor	91%	2	46%	1	47%	0	0	0	4	1	0%	0	3	2
AC-CCR	5	Very Poor	87%	2	58%	0	35%	1	0	0	3	0	0%	0	3	2
AC-PPD	5	Very Poor	90%	2	45%	1	40%	0	0	0	2	0	0%	0	3	2
SC-MB	4	Very Poor	85%	3	68%	0	46%	0	0	0	2	0	0%	0	1	1
EC-MD	3	Very Poor	93%	1	52%	0	42%	0	0	0	1	0	0%	0	3	2

Table C-11.7. Index of Biotic Integrity Scores for Spring 2004

Reach	Total IBI Score	IBI Rating	% CF+ CG		% Non-Insect Taxa		% Tolerant Taxa		Coleoptera Taxa		Predator Taxa		% Intolerant Individuals		EPT Taxa	
			Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score	Metric value	IBI score
REF-BC	50	Good	67%	8	20%	7	11%	8	5	8	10	7	8%	3	16	9
REF-TCAS	42	Good	78%	5	15%	8	14%	7	3	5	7	4	12%	4	16	9
CC-CR	31	Fair	64%	8	30%	4	18%	6	1	2	10	7	0%	0	7	4
REF-CS	21	Poor	90%	2	29%	5	22%	5	1	2	5	2	1%	1	7	4
TC-DO	17	Poor	98%	0	24%	6	32%	2	3	5	5	2	0%	0	4	2
SJC-74	15	Poor	77%	5	42%	2	20%	5	0	0	5	2	0%	0	3	1
AC-PPD	11	Very Poor	82%	4	38%	3	26%	3	0	0	2	0	0%	0	3	1
SJC-CC	10	Very Poor	94%	1	39%	2	22%	5	0	0	2	0	0%	0	4	2
ACJ01	9	Very Poor	84%	4	51%	0	28%	3	0	0	3	0	0%	0	4	2
EC-MD	9	Very Poor	83%	4	52%	0	27%	3	0	0	4	1	0%	0	3	1
LC-133	8	Very Poor	92%	2	44%	1	27%	3	0	0	4	1	0%	0	3	1
AC-CCR	7	Very Poor	95%	1	43%	1	25%	4	0	0	3	0	0%	0	3	1
SD-AP	6	Very Poor	91%	2	46%	1	28%	3	0	0	3	0	0%	0	0	0
TC-AP	5	Very Poor	92%	2	52%	0	36%	1	0	0	4	1	0%	0	3	1
SC-MB	3	Very Poor	97%	0	59%	0	27%	3	0	0	3	0	0%	0	1	0

Table C-11.8. Stream Bioassessment Monitoring Sites

Stream Bioassessment Monitoring Sites, Orange County

Hydrologic Unit	Station Designation	Location	Station Coordinates	Elevation
San Mateo	CC-CR	Christianitos Creek at Christianitos Road	33° 27.996' 117° 34.085'	240
San Clemente	SD-AP	Segunda Descheca upstream of Avenida Presidio	33° 26.618' 117° 36.918'	110
San Juan Creek	TC-AP	Trabuco Creek at the end of Avery Parkway	33° 32.385' 117° 39.783'	230
	TC-DO	Trabuco Creek at Del Obispo Rd.	33° 29.865' 117° 39.966'	80
	SJC-74	San Juan Creek at Highway 74	33° 31.156' 117° 37.514'	160
	SJC-CC	San Juan Creek between Camino Capistrano and I-5	33° 29.519' 117° 39.774'	70
Dana Point	SC-MB	Salt Creek at Monarch Beach Golf Links	33° 28.991' 117° 43.204'	60
Aliso Creek	AC-CCR	Aliso Creek at Country Club Rd	33° 30.749' 117° 44.959'	15
	ACJ01	Aliso Creek in Aliso/Woods Canyon Park	33° 32.610' 117° 43.950'	75
	AC-PPD	Aliso Creek at Pacific Park Dr.	33° 34.369' 117° 42.984'	195
	EC-MD	English Creek at Madero Dr.	33° 37.650' 117° 40.823'	430
Laguna	LC-133	Laguna Canyon Creek along Highway 133	33° 34.421' 117° 45.786'	175
Reference Sites	REF-CS	San Juan Creek at Cold Spring	33° 34.967' 117° 31.409'	605
	REF-BC†	Bell Creek in the Starr Ranch Audubon Sanctuary	33° 38.168' 117° 33.349'	1015
	REF-TCAS	Arroyo Trabuco upstream of Alder Spring	33° 40.451' 117° 32.058’	1510
	REF-SVC*	Silverado Canyon downstream of Belha Way	33° 44.751’ 117° 36.092’	1590

*Site sampled in October 2003 only
† Site sampled in May 2004 only

Table C-11.9. Toxicity Test Results for the 2003 / 2004 Bioassessment Sampling Periods

Station	Date	Acute Hyallella Azteca Survival		Chronic Selenastrum Algae Growth			Chronic Ceriodaphnia Survival and Reproduction					
		96-hr		96-hr			7-day Survival			7-day Reproduction		
		% survival in 100%	TUa	NOEC	IC50	TUc	NOEC	IC50	TUa	NOEC	IC50	TUc
ACJ01	10/15/03	85	0.69	100.00	>100.00	1.00	50.00	87.50	1.09	50.00	78.08	2.00
AC-CCR	10/23/03	90	0.59	100.00	>100.00	1.00	100.00	>100.00	0.59	100.00	>100.00	1.00
AC-PPD	10/15/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.59	<50.00	>100.00	>2.00
CC-CR	10/28/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.00	100.00	>100.00	1.00
EC-MD	10/15/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.59	<50.00	>100.00	>2.00
LC-133	10/24/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
REF-CS	10/28/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
SC-MB	10/15/03	45	1.02	100.00	>100.00	1.00	100.00	>100.00	0	50.00	>100.00	2.00
SD-AP	10/10/03											
SJC-CC	10/10/03											
SJC-74	10/28/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
TC-AP	10/28/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
TC-DO												
REF-TCAS	10/23/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.59	50.00	88.24	2.00
REF-SVC	10/23/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.77	100.00	>100.00	1.00
ACJ01	5/26/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.77	100.00	>100.00	1.00
AC-CCR	5/25/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.77	100.00	>100.00	1.00
AC-PPD	5/26/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
CC-CR	5/13/04	95	0.41	NS	NS	NS	100.00	>100.00	0	100.00	>100.00	1.00
EC-MD	5/25/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
LC-133	5/25/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
REF-BC	5/5/04	100	0.00	NA	NA	NA	100.00	>100.00	0	100.00	>100.00	1.00
REF-CS	5/26/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
REF-TCAS	5/5/04	100	0.00	NA	NA	NA	100.00	>100.00	0	100.00	>100.00	1.00
SC-MB	5/25/04	95	0.41	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
SD-AP	5/13/04	100	0.00	NA	NA	NA	50.00	>100.00	0	50.00	80.37	2.00
SJC-CC	5/13/04	100	0.00	NA	NA	NA	100.00	>100.00	0	100.00	>100.00	1.00
SJC-74	5/26/04	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
TC-AP	5/5/04	100	0.00	NA	NA	NA	100.00	>100.00	0	100.00	>100.00	1.00
TC-DO	5/13/04	100	0.00	NA	NA	NA	100.00	>100.00	0	100.00	>100.00	1.00

Table C-11.10. Toxicity Test Results for the Spring (June) 2003 Bioassessment Sampling Period

Station	Date	Acute Hyallella Azteca Survival		Chronic Selenastrum Algae Growth			Chronic Ceriodaphnia Survival and Reproduction					
		96-hr		96-hr			7-day Survival			7-day Reproduction		
		% survival in 100%	TUa	NOEC	IC50	TUc	NOEC	IC50	TUa	NOEC	IC50	TUc
ACJ01	6/12/03	90	0.59	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
AC-CCR	6/25/03	95	0.41	100.00	>100.00	1.00	100.00	>100.00	0.77	100.00	>100.00	1.00
AC-PPD	6/12/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
CC-CR	6/17/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
LC-133	6/25/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
PD-CGV	6/10/03	100	0.00	100.00	>100.00	1.00	25.00	33.33	1.18	12.50	31.81	8.00
REF-BC	6/10/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0.59	100.00	>100.00	1.00
REF-CS	6/18/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
REF-TCAS	6/18/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
SC-MB	6/25/03	90	0.59	100.00	>100.00	1.00	50.00	74.14	1.18	50.00	70.47	2.00
SD-AP	6/10/03	100	0.00	100.00	>100.00	1.00	50.00	66.67	1.18	12.50	23.53	8.00
SJC-CC	6/12/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
SJC-74	6/25/03	95	0.41	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
TC-AP	6/17/03	100	0.00	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00
TC-DO	6/12/03	95	0.41	100.00	>100.00	1.00	100.00	>100.00	0	100.00	>100.00	1.00

Table C-11.11. Chemistry Sampling Results for the Bioassessment Sampling Periods

Location	Date	Type	Field Measurements				Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
			EC	pH	TEMP	DO																								
			µS		C	mg/L	NTU	µS		mg/L							ng/L				µg/L									mg/L
AC-CCR	10/23/2003	DT	3183	8.4	20.1	8.9	12	3310	8.4	6.6	0.074	0.91	0.952	0.237	25	<10	<5	<5	<5	<5	<1	<8	<2	3.6	13	<2	<10			
AC-CCR	10/23/2003	DF																			<1	<8	8.3	4.4	12	<2	11			
AC-CCR	5/25/2004	DT	3156	7.9	19.74	7.15	2.3	3060	8.2	0.92	<0.05	0.69	0.645	0.162	<10	<10	28.4	<5	<5	<5	<1	<8	3.3	<2	19	<2	12			1048
AC-CCR	5/25/2004	DF																			<1	<8	2.2	<2	17	<2	40			
ACJ01	10/15/2003	DT	3279	8.17	20.81	10.04	3.8	3370	8.1	7.5	0.053	1	0.921	0.278	<10	<10	67.9	<5	<5	<5	2.2	<8	3.7	<2	26	<2	11			
ACJ01	10/15/2003	DF	3279	8.17	20.81	10.04															1.5	<8	2.1	<2	24	<2	22			
ACJ01	5/26/2004	DT					1.7	3150	8.2	4.4	<0.05	1.1	1.01	0.26	<10	<10	18.5	<5	<5	<5	2.1	<8	3.1	3	25	<2	23			
ACJ01	5/26/2004	DF																			<1	<8	<2	<2	<4	<2	18			
ACJ01	10/5/2004	DT					1.1	2670	8.1	5.7	0.059	0.6	1.11	0.36	<10	<10	28.5	<5	<5	<5										
AC-PPD	10/15/2003	DT					4.2	2840	8.1	4.8	0.157	0.99	0.522	0.121	<10	<10	104	<5	<5	<5	<1	<8	3	<2	<4	<2	<10			
AC-PPD	10/15/2003	DF																			<1	<8	3	<2	4.2	<2	20			
AC-PPD	5/26/2004	DT					1.6	2750	8.1	3.1	<0.05	0.69	0.491	0.108	<10	<10	13.3	<5	<5	<5	<1	<8	3.6	<2	7.1	<2	26			
AC-PPD	5/26/2004	DF																			<1	<8	2.5	<2	24	<2	31			
AC-PPD	10/5/2004	DT					1.9	2300	8.1	3.7	0.1	0.64	0.583	0.17	<10	<10	17.8	<5	<5	<5										
CC-CR	10/28/2003	DT	990	7.8	13.4	10.2	12	1290	7.9	<0.44	<0.05	0.25	<0.0305	<0.01	50	11	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
CC-CR	10/28/2003	DF																			<1	<8	<2	<2	<4	<2	<10			
CC-CR	5/13/2004	DT					7.6	1350	7.8	<0.44	<0.05	0.47	0.0307	<0.01	26	<10	<5	<5	<5	<5	<1	<8	3.8	<2	<4	<2	17			
CC-CR	5/13/2004	DF																			<1	<8	2.2	<2	<4	<2	44			
EC-MD	10/15/2003	DT	1929	8.53	20.27	11.54	3.7	1990	8.5	3.8	0.122	1.1	0.645	0.176	<10	<10	13.5	<5	<5	<5	<1	<8	2.4	<2	<4	<2	<10			
EC-MD	10/15/2003	DF	1929	8.53	20.27	11.54															<1	<8	2.1	<2	<4	<2	15			
EC-MD	5/25/2004	DT	2071	8.53	17.43	12.39	0.75	2040	8.5	<0.44	<0.05	0.74	0.43	0.11	<10	<10	29.7	<5	<5	<5	<1	<8	3.8	<2	6.5	<2	13			616
EC-MD	5/25/2004	DF																			<1	<8	3.1	<2	6.1	<2	25			
EC-MD	10/5/2004	DT					2.7	1730	8.2	<0.44	<0.05	0.38	0.645	0.19	11	<10	<5	<5	<5	<5										
LC-133	10/23/2003	DT	1516	8	18.4	7	7.7	2000	8.1	0.88	<0.05	0.48	0.768	0.215	13	<10	<5	<5	<5	<5	<1	<8	4.2	<2	<4	<2	<10			
LC-133	10/23/2003	DF																			<1	<8	<2	<2	<4	<2	<10			
LC-133	5/25/2004	DT	1929	7.91	16.77	7.29	2.2	1880	8	0.66	<0.05	0.49	0.829	0.222	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	4.4	<2	<10			616
LC-133	5/25/2004	DF																			<1	<8	3.5	<2	4.1	<2	39			
REF-BC	5/5/2004	DT					0.4	824	8	<0.44	<0.05	<0.2	0.0921	0.016	<10	<10	<5	<5	<5	<5	<1	<8	2	<2	<4	<2	18			
REF-BC	5/5/2004	DF																			<1	<8	2.6	<2	<4	<2	41			
REF-BC	10/5/2004	DT					1.1	782	7.5	<0.44	<0.05	<0.2	0.089	<0.01	<10	<10	<5	<5	<5	<5										
REF-CS	10/28/2003	DT	603	8.6	17.8	10.9	2.2	617	8.4	<0.44	<0.05	0.26	0.154	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
REF-CS	10/28/2003	DF																			<1	<8	<2	<2	<4	<2	<10			

Location	Date	Type	Field Measurements				Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
			EC	pH	TEMP	DO																								
REF-CS	5/26/2004	DT					110	621	8.1	<0.44	<0.05	<0.2	0.0614	<0.01	520	140	<5	<5	<5	37.5	<1	<8	<2	<2	<4	<2	17			
REF-CS	5/26/2004	DF																			<1	<8	<2	<2	<4	<2	<10			
REF-SVC	10/23/2003	DT	1093	8.2	16.2	8.3	1.5	1270	8.2	<0.44	<0.05	0.31	<0.0305	0.011	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	14			
REF-SVC	10/23/2003	DF																			<1	<8	<2	<2	<4	<2	10			
REF-TCAS	10/23/2003	DT	834	7.9	15.2	7.5	1	858	8	<0.44	<0.05	<0.2	0.184	0.013	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
REF-TCAS	10/23/2003	DF																			<1	<8	<2	3.8	<4	<2	<10			
REF-TCAS	5/5/2004	DT					0.35	664	8.2	<0.44	<0.05	<0.2	<0.0305	0.142	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
REF-TCAS	5/5/2004	DF																			<1	<8	2	<2	<4	<2	29			
SC-MB	10/15/2003	DT	3543	7.99	18.97	9.38	33	3660	8.1	7.9	0.231	1.8	2.67	0.577	63	11	159	<5	<5	<5	<1	<8	7.2	<2	11	<2	14			
SC-MB	10/15/2003	DF	3543	7.99	18.97	9.38															<1	<8	4.7	<2	10	<2	23			
SC-MB	5/25/2004	DT	3583	7.79	17.42	8.06	7.4	3490	7.9	7.9	0.17	1.7	1.81	0.5	14	<10	67.6	<5	<5	<5	<1	<8	8.5	3.3	13	<2	25			1136
SC-MB	5/25/2004	DF																			<1	<8	5.7	<2	12	<2	51			
SD-AP	10/10/2003	DT	4743	8	17.8	8.49	6.2	4800	8.1	12	<0.05	1.4	1.63	0.485	18	<10	48.6	<5	<5	<5	2	<8	4.7	<2	34	<2	<10			1430
SD-AP	10/10/2003	DF																			<1	<8	3.7	<2	33	<2	12			
SD-AP	5/13/2004	DT					4.5	4960	8	7.5	<0.05	1.4	0.952	0.233	15	<10	<5	<5	<5	<5	2.7	<8	4.3	<2	57	<2	16			
SD-AP	5/13/2004	DF																			2	<8	5	<2	47	<2	57			
SD-AP	10/4/2004	DT					0.8	4910	8.1	13	<0.05	0.83	1.23	0.4	<10	<10	83.5	<5	<5	<5										
SD-AP	10/4/2004	DT	4133	8.12	14.19	14.38																								1564
SJC-74	10/28/2003	DT	1712	7.28	19.79	6.68	5.4	1730	7.2	<0.44	<0.05	0.32	0.491	0.037	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
SJC-74	10/28/2003	DF																			<1	<8	<2	<2	<4	<2	<10			
SJC-74	5/26/2004	DT					13	1520	7.4	<0.44	<0.05	0.42	0.675	0.013	23	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	29			
SJC-74	5/26/2004	DF																			<1	<8	15	<2	<4	<2	32			
SJC-CC	10/10/2003	DT	2462	7.45	19.03	6	7.3	2440	7.2	1.3	0.071	0.84	0.276	<0.01	<10	<10	22.7	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			798
SJC-CC	10/10/2003	DF																			<1	<8	<2	<2	<4	<2	<10			
SJC-CC	5/13/2004	DT					9.1	2420	7.4	1.3	0.072	0.58	0.215	0.024	<10	<10	<5	<5	<5	<5	<1	<8	2.6	<2	8.4	<2	16			
SJC-CC	5/13/2004	DF																			<1	<8	4.1	<2	11	<2	49			
TC-AP	10/28/2003	DT	1179	8.2	15.27	9.5	7.1	1220	8.2	<0.44	<0.05	0.27	0.276	0.068	20	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
TC-AP	10/28/2003	DF																			<1	<8	<2	7.9	<4	<2	<10			
TC-AP	5/5/2004	DT					2.6	1170	8	<0.44	<0.05	0.3	0.399	0.087	<10	<10	<5	<5	<5	<5	<1	<8	<2	<2	<4	<2	<10			
TC-AP	5/5/2004	DF																			<1	<8	<2	<2	<4	<2	36			
TC-AP	10/4/2004	DT	1134	8.03	18.42	15.38	1.7	1270	8.2	<0.44	<0.05	<0.2	0.0921	0.076	<10	<10	<5	<5	<5	<5										464
TC-AP	10/4/2004	DT	1134	8.03	18.42	15.36																								464
TC-DO	10/10/2003	DT	2298	8.23	20.04	11.55	1.3	2300	8.2	<0.44	<0.05	0.56	<0.0305	<0.01	<10	<10	28.1	<5	<5	<5	<1	<8	2.2	<2	<4	<2	<10			810
TC-DO	10/10/2003	DF																			<1	<8	3.2	<2	<4	<2	<10			
TC-DO	5/13/2004	DT					0.7	3050	8.7	<0.44	0.061	0.94	<0.0305	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	3.2	<2	8.6	<2	<10			
TC-DO	5/13/2004	DF																			<1	<8	6.2	<2	8.7	<2	19			

Table C-11.12. Mass Loads from Sampled Storms 2003-2004

Station	Period	Weather	Volume Sampled	Type	Nitrate As NO_3	NH_3 as N	TKN	Total Phos. as PO_4	Ortho Phos. as P	TSS	VSS	Cd	Cr	Cu	Pb	Ni	Ag	Zn	Hardness as $CaCO_3$
			ac-ft		lbs					tons		lbs							tons
ACJ01	Nov 1-5, 2003	Storm	142	Total	3538	183	1295	840	128	24.53	5.33	2.2	1.5	9.6	1.5	14.4	0.4	36.6	137.8
				Dissolved								0.2	1.5	2.9	0.4	9.8	0.4	8.2	
	Feb 3-7, 2004	Storm	390	Total								2.9	4.2	19.7	5.5	23.1	1.1	99.7	244.3
				Dissolved								0.6	4.2	7.2	1.1	13.6	1.1	79.1	
	Feb 18-24, 2004	Storm	1667	Total	22,509	439	5381	6542	1118	242.1	39.28	10.4	35.4	84.4	15.7	93.8	4.5	273.5	801.1
				Dissolved								2.3	18.1	26.9	4.5	62.6	5.5	339.2	
SJNL01	Nov 1-5, 2003	Storm	3	Total	28	2	43	20	1	2.03	0.40	0	0.1	0.6	0.1	0.2	0	1	2.181
				Dissolved								0	0	0	0	0.1	0	0	
	Nov 12-15, 2003	Storm	1	Total	3	0	3	4	0	0.037	0.012	0	0	0	0	0	0	0	0.881
				Dissolved								0	0	0	0	0	0	0.1	
	Feb 2-6, 2004	Storm	83	Total	1308	6	156	150	34	3.04	0.86	0.1	0.9	1	0.2	0.5	0.2	1.1	45.96
				Dissolved								0.1	0.9	1.3	0.2	0.5	0.2	2.7	
	Feb 18-22, 2004	Storm	46	Total	562	2	92	90	17	3.04	0.63	0.1	0.5	1.9	0.5	0.5	0.2	4.4	23.95
				Dissolved								0.1	0.5	1	0.1	0.3	0.1	6.7	
TCOL02	Nov 12-15, 2003	Storm	70	Total	861	5	175	147	19	4.47	0.79	0.1	0.8	1.7	0.2	1.4	0.2	3.2	75.39
				Dissolved								0.1	0.8	1.1	0.2	1.1	0.2	3.7	
	Feb 3-6, 2004	Storm	172	Total	1873	25	478	401	44	38.8	4.54	0.5	3.3	5.5	1.4	4.5	0.5	17.7	83.79
				Dissolved								0.2	1.9	1.6	0.5	1.4	0.5	2.3	
	Feb 18-22, 2004	Storm	353	Total	3925	58	1160	1628	120	267.6	20.6	1.6	12.2	20.2	4.7	15.8	1.4	63.2	160.3
				Dissolved								0.5	3.8	5.4	1	4.9	1	46.8	

Table 11-13. Flow-Weighted Event Mean Concentrations for Sampled Storms 2003-2004

Station	Period	Volume Sampled	Nitrate as NO_3	NH_3 as N	TKN	Total Phos. as PO_4	Ortho Phos. as P	TSS	VSS	Total Recoverable Metals Cd	Cr	Cu	Pb	Ni	Ag	Zn
		ac-ft	mg/L							µg/L						
ACJ01	Nov 1-5, 2003	142	9.17	0.47	3.36	2.18	0.33	127	28	5.7	3.9	24.9	3.9	37.3	1.04	94.8
	Feb 18-24, 2004	1667	4.97	0.10	1.19	1.44	0.25	107	17	2.3	7.8	18.6	3.5	20.7	0.99	60.4
SJNL01	Nov 1-5, 2003	3	3.43	0.25	5.27	2.45	0.12	499	98	0.0	12.3	73.6	12.3	24.5	0.00	123
	Feb 2-6, 2004	83	5.80	0.03	0.69	0.66	0.15	29	8	0.4	4.0	4.4	0.9	2.2	0.89	4.9
	Feb 18-22, 2004	46	4.49	0.02	0.74	0.72	0.14	49	10	0.8	4.0	15.2	4.0	4.0	1.60	35.2
TCOL02	Nov 12-15, 2003	70	4.53	0.03	0.92	0.77	0.10	47	8	0.5	4.2	8.9	1.1	7.4	1.05	16.8
	Feb 3-6, 2004	172	4.01	0.05	1.02	0.86	0.09	166	19	1.1	7.1	11.8	3.0	9.6	1.07	37.9
	Feb 18-22, 2004	353	4.09	0.06	1.21	1.70	0.13	558	43	1.7	12.7	21.1	4.9	16.5	1.46	65.9

Table C-11.14. Summary of Exceedances of CTR Criteria at Mass Loading Stations for Sampled Storms 2003-2004

				Freshwater				Saltwater						
		Sample Size		Acute		Chronic		Acute			Chronic			
Station	Channel	Acute	Chronic	Cu	Zn	Cd	Ni	Cu	Ni	Zn	Cd	Cu	Ni	Zn
ACJ01	Aliso Creek in Aliso/Wood Canyon Park	11	2					9				2	2	
LCWI02	Laguna Canyon Channel at Woodland	8	1	1	1			7		1		1		
PDCM01	Prima Deshecha at Calle Grande Vista	11	3			3		11	6	3	2	3	3	
SDCM02	Segunda Deshecha at El Camino Real	2	1				1	2	1	1		1	1	1
SJNL01	San Juan Creek at La Novia	13	3					9				2		
TCOL02	Trabuco Creek at Del Obispo	12	1					6		2		1		
	Totals	57	11	1	1	3	1	44	7	7	2	10	6	1

Table C-11.15. Toxicity Test Results for Mass Loading Stations

Station	Event	Chronic Sea Urchin Fertilization			Chronic Sea Urchin Development			Chronic Mysidopsis Bahia Survival and Growth						Storm Sample
								Survival			Growth			
		NOEC	96 hr IC50	TUc	NOEC	96 hr IC50	TUc	NOEC	96hr IC50	TUa	NOEC	96hr IC50	Tuc	
ACJ01	11/1/03	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	FF
ACJ01	11/13/03	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	SNA
ACJ01	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.51	100.00	>100.00	1.00	SF
ACJ01	2/18/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SF
LCWI02	11/1/03	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	FF-NR
LCWI02	11/13/03	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	SF-NR
LCWI02	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	80.44	1.24	100.00	>100.00	1.00	SF
LCWI02	2/18/04	50.00	>100.00	2.00	50.00	>100.00	2.00	100.00	>100.00	0.65	100.00	>100.00	1.00	SF
PDCM01	11/1/03	25.00	73.89	4.00	50.00	>100.00	2.00	<50.00	33.93	2.95	<50.00	73.11	>2.00	FF
PDCM01	11/13/03	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	SNA
PDCM01	2/3/04	50.00	>100.00	2.00	50.00	>100.00	2.00	50.00	100.00	1.00	100.00	>100.00	1.00	SF
PDCM01	2/18/04	12.50	72.69	8.00	50.00	80.14	2.00	100.00	>100.00	0.00	100.00	>100.00	1.00	SF
SJNL01	11/1/03	50.00	>100.00	2.00	100.00	>100.00	1.00	<50.00	58.70	1.70	50.00	75.00	2.00	FF
SJNL01	11/13/03	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	1.00	SF
SJNL01	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	95.46	1.05	100.00	>100.00	1.00	SF
SJNL01	2/18/04	50.00	>100.00	2.00	100.00	>100.00	1.00	50.00	>100.00	0.65	500.00	>100.00	2.00	SF
TCOL02	11/1/03	25.00	61.04	4.00	100.00	>100.00	1.00	50.00	>100.00	0.89	100.00	>100.00	1.00	FF
TCOL02	11/13/03	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	1.00	SF
TCOL02	2/3/04	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.87	100.00	>100.00	1.00	SF
TCOL02	2/18/04	25.00	80.92	4.00	100.00	>100.00	1.00	100.00	>100.00	0.41	100.00	>100.00	1.00	SF

Table C-11.16 Coastal Stormdrain Station Names

Site Name	Location	Details
ELMORO	El Moro Bay	just north of entrance on southside PCH
EMRLD	Emerald Bay	drain system on roadway leading to beach
HEISLR	Cliff Dr.	bottom of stairway
MAINBC	Main Beach	at intersection of PCH/Laguna Cyn
VICTRA	Victoria	below adjacent to playground
CLEO	Cleo St.	just left of bottom of stairway
BLUBRD	Bluebird Canyon	bottom of roadway
PEARL	Pearl St.	bottom of roadway
DUMOND	Dumond	bottom of roadway
BLULGN	Blue Lagoon	behind rocks under cement wall @ NW corner
ACM1	Aliso Creek	just north of PCH entrance
WEST	West St.	to right of bottom of stairway
SCM1	Salt Creek (Monarch Bay)	large pipe emptying onto beach
DSB5	North Beach Creek	pool south of metered parking lot @ Doheny
SJC1	San Juan Creek	large pond at south of main parking lot
DSB4	Capistrano State Beach	Doheny State Beach/ MLR
DSB1	Capistrano State Beach	Doheny State Beach/ MLR
CSBMP1	Capistrano State Beach	main parking lot
CSBBR1	Beach Road Community	in private housing community
POCHE	Poche	north end of Poche Beach
SCCS52	Capistrano Shores	northern end of private housing community
SCCS17	Capistrano Shores	near entrance of private housing community
PICO	Pico	south end of private housing community
MARIPO	Mariposa	between Mariposa and North Beach
LINDAL	Linda Lane	adjacent to tracks at bottom Linda Lane park
PIER	SC Pier	beneath San Clemente Pier
TRFCYN	Trafalgar Cyn.	canyon outlet north of pedastrian bridge
LADERA	La Ladera	pipe located at bottom of hill
RIVERA	Riviera	outlet under train bridge at stairway

Table C-11.17. Pattern of AB411 Exceedances at Coastal Stormdrains With More Than Five Exceedances

Site	Upcoast			Downcoast		
	Total Coliforms	Fecal Coliforms	Enterococcus	Total Coliforms	Fecal Coliforms	Enterococcus
MAINBC: Main Beach			3			5
ACM1: Aliso Creek N of PCH entrance	1	1	4	1	1	2
SCM1: Salt Creek (Monarch Beach)	2	5	15		4	19
DSB5: North Beach	2	3	16	1	6	19
SJC1: San Juan Creek	3	9	25		12	28
DSB4: Doheny State Beach					3	15
DSB1: Doheny State Beach			3		1	7
CSBMP1: Capistrano State Beach			7			11
CSBBR1: Capistrano State Beach		1	7	1	2	8
POCHE: Poche Beach		2	9			12
PICO: Pico	1	1	4	1	1	10
MARIPO: Between Mariposa & North Beach	2	1	1			2
LINDAL: Linda Lane		1	1	1	1	3
PIER: San Clemente Pier	1	2	5		2	3

Table C-11.18. Summary of Relationship Between Discharge and Receiving Water, From Figure C-11.6

Site	Indicator	Dry weather	Wet weather
MAINBC	Enterococcus	Affects receiving water only occasionally	Affects receiving water only occasionally
ACM1	Enterococcus	Not enough data for conclusion	Affects receiving water only occasionally
SCM1	Enterococcus	Receiving water effects likely	Affects receiving water only occasionally
	Fecal coliform	Affects receiving water only occasionally	Affects receiving water only occasionally
DSB5	Enterococcus	Affects receiving water only occasionally	Receiving water effects likely
	Fecal coliform	Does not affect receiving water	Affects receiving water somewhat
SJC1	Enterococcus	Affects receiving water somewhat	Receiving water effects likely
	Fecal coliform	Affects receiving water only occasionally	Receiving water effects likely
DSB1	Enterococcus	Does not affect receiving water	Does not affect receiving water
CSBMP1	Enterocossus	Does not affect receiving water	Affects receiving water somewhat
CSBBR1	Enterococcus	Does not affect receiving water	Affects receiving water somewhat
POCHE	Enterococcus	Receiving water effects likely	Does not affect receiving water
PICO	Enterococcus	Affects receiving water only occasionally	Affects receiving water somewhat
PIER	Enterococcus	Affects receiving water somewhat	Does not affect receiving water

Table C-11.19. Toxicity Testing Results at the Ambient Coastal Monitoring Stations

Station	Event	Chronic Sea Urchin Fertilization			Chronic Sea Urchin Development			Chronic Mysidopsis Bahia Survival and Growth						Storm Sample
								Survival			Growth			
		NOEC	96 hr IC50	TUc	NOEC	96 hr IC50	TUc	NOEC	96hr IC50	TUa	NOEC	96hr IC50	Tuc	
ACM-1	1/21/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	>100.00	0.96	100.00	>100.00	1.00	DW
ACM-1	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	25.00	61.91	1.62	50.00	82.54	2.00	SW
ACM-1	4/2/04	25.00	>100.00	4.00	100.00	>100.00	1.00	100.00	>100.00	0.59	100.00	>100.00	1.00	SW
ACM-1	4/13/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.00	100.00	>100.00	1.00	DW
DAPTEB	2/25/04	50.00	>100.00	2.00	50.00	76.27	2.00	100.00	>100.00	0.59	100.00	>100.00	1.00	SW
DAPTEB	2/27/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.51	100.00	>100.00	1.00	SW
DAPTWB	2/25/04	50.00	>100.00	2.00	50.00	>100.00	2.00	100.00	>100.00	0.00	100.00	>100.00	1.00	SW
DAPTWB	2/27/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SW
DAPTDC	2/25/04	25.00	>100.00	4.00	25.00	63.60	4.00	100.00	>100.00	0.00	100.00	>100.00	1.00	SW
DAPTDC	2/27/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SW
DAPTLR	2/25/04	50.00	>100.00	2.00	50.00	75.10	2.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SW
DAPTLR	2/27/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SW
LB-2	1/21/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	>100.00	0.99	100.00	>100.00	1.00	DW
LB-2	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	70.33	1.42	25.00	61.00	4.00	SW
LB-2	4/13/04	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.41	100.00	>100.00	1.00	DW
LB-3	1/21/04	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	DW
LB-3	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	79.97	1.25	100.00	>100.00	1.00	SW
LB-3	4/13/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	72.06	1.39	50.00	75.00	2.00	DW
SCM-1	1/21/04	50.00	>100.00	2.00	100.00	>100.00	1.00	50.00	73.61	1.36	50.00	63.88	2.00	DW
SCM-1	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	25.00	34.60	2.89	25.00	38.92	2.00	SW
SCM-1	4/2/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	97.22	1.03	50.00	71.37	2.00	SW
SCM-1	4/13/04	100.00	>100.00	1.00	100.00	>100.00	1.00	100.00	>100.00	0.51	100.00	>100.00	1.00	DW
SJC-1	1/21/04	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.51	100.00	>100.00	1.00	DW
SJC-1	2/3/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	>100.00	0.93	100.00	>100.00	1.00	SW
SJC-1	4/2/04	50.00	>100.00	2.00	100.00	>100.00	1.00	100.00	>100.00	0.23	100.00	>100.00	1.00	SW
SJC-1	4/13/04	100.00	>100.00	1.00	100.00	>100.00	1.00	50.00	>100.00	0.77	100.00	>100.00	1.00	DW

Table C-11.20. Chemistry Monitoring Results at the Ambient Coastal Monitoring Stations With CTR Exceedances in Bold

Location	Date	Type	Field Measurements EC	pH	TEMP	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
			µS		C	mg/L	NTU	µS		mg/L							ng/L				µg/L									mg/L
ACM-1	7/10/03	DT																												
ACM-1	7/30/03	DT	6573	7.42	23.02	6.87	16	7250	7.9	2.6	0.142	0.81	0.52	0.159	15	<10	<5	<5	<5	<5	<1	<8	31	2.6	14	<2	32			1362
ACM-1	1/21/04	ST	10509	7.89	14.02	10.34	1.9	12080	8	3.6	<0.05	0.53	0.307	0.11	<10	<10	<5	<5	<5	<5	1.1	<8	2.3	<2	17	<2	<10			1886
ACM-1	1/21/04	SF	10509	7.89	14.02	10.34															1.1	<8	3	<2	17	<2	27			1886
ACM-1	1/28/04	DT					2.6	4730	8.2	2.3	<0.05	0.57	0.43	0.106	<10	<10	<5	<5	<5	<5	<1	<8	2.2	<2	16	<2	<10			
ACM-1	1/28/04	DF																			<1	<8	3.6	<2	15	2.6	25			
ACM-1	2/3/04	DT																			1.4	<8	11	3.1	13	<2	45			
ACM-1	2/3/04	DF																			<1	<8	3.1	<2	8.3	<2	12			
ACM-1	4/2/04	DT					16	2130	7.2	15	0.5	2.9	0.706	0.135	18	<10	123	<5	<5	162	1.7	<8	37	<2	25	<2	33			
ACM-1	4/2/04	DF																			<1	<8	**6.5**	<2	23	<2	89			
ACM-1	4/13/04	DT	3408	7.72	18.84	10.05	1.3	4350	8	2.8	<0.05	0.96	0.553	0.184	<10	<10	38	<5	<5	<5										1140
DAPTBD	12/11/03	DT	51148	8.16	15.94	11.49	1.9	49000	8.1	<0.44	<0.05	0.69	<0.0305	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	9.1	<2	6.5	<2	<10			
DAPTBD	12/11/03	DF																			<1	<8	**5.7**	<2	10	<2	<10			
DAPTBD	5/21/04	DT																												
DAPTBD	5/24/04	DT					3.5	47100	8.1	<0.44	<0.05	0.2	0.0921	<0.01	<10	<10	<5	<5	<5	<5										
DAPTBD	6/2/04	DT	52180	8.1	21.06	7.56	2	46700	8.1	<0.44	<0.05	0.22	<0.0305	0.01	<10	<10	<5	<5	<5	<5	<1	<8	6	<2	11	<2	11			
DAPTBD	6/2/04	DF																			<1	<8	**6.7**	<2	9	<2	10			
DAPTDC	12/11/03	DT	51139	8.11	15.94	10.37	1.4	49000	8.1	<0.44	<0.05	0.54	<0.0305	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	8.6	<2	5.8	<2	<10			
DAPTDC	12/11/03	DF																			<1	<8	**5.8**	<2	4.6	<2	<10			
DAPTDC	2/25/04	DT	42402	8.1	14.39	3.59																								
DAPTDC	2/27/04	DT	53040	8.02	14.46	2.223															<1	<8	4.7	<2	12	<2	11			
DAPTDC	2/27/04	DF																			<1	<8	2.7	<2	11	<2	<10			
DAPTDC	5/21/04	DT																												
DAPTDC	5/24/04	DT					2.6	46800	8.1	<0.44	<0.05	0.29	0.123	<0.01	<10	<10	<5	<5	<5	<5										
DAPTDC	6/2/04	DT	52240	8.08	20.61	7.35	1.4	46800	8.1	<0.44	<0.05	0.23	0.0307	0.013	<10	<10	<5	<5	<5	<5	<1	<8	6.4	<2	8.8	<2	<10			
DAPTDC	6/2/04	DF																			<1	<8	**9.8**	2.1	9	<2	17			

			Field Measurements																											
Location	Date	Type	EC	pH	TEMP	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
DAPTEB	12/11/03	DT	51135	8.03	15.57	9.27	2.6	48800	8	<0.44	<0.05	0.61	<0.0305	<0.01	<10	<10	<5	<5	<5	<5	1.9	<8	21	<2	6.2	<2	42			
DAPTEB	12/11/03	DF																			<1	<8	**11**	<2	9.6	<2	32			
DAPTEB	2/25/04	DT	39841	8.1	14.46	3.6																								
DAPTEB	2/27/04	DT	51611	7.98	14.72	1.65															<1	<8	11	<2	14	<2	29			
DAPTEB	2/27/04	DF																			<1	<8	**9**	<2	13	<2	26			
DAPTEB	5/21/04	DT																												
DAPTEB	5/24/04	DT					3.1	46500	8.1	<0.44	<0.05	0.2	0.154	0.02	<10	<10	<5	<5	<5	<5										
DAPTEB	6/2/04	DT	52150	8.01	20.75	7.68	1.4	46100	8.1	<0.44	<0.05	0.85	<0.0305	0.013	<10	<10	<5	<5	<5	<5	<1	<8	15	<2	10	<2	32			
DAPTEB	6/2/04	DF																			<1	<8	**11**	<2	9.5	<2	21			
DAPTLR	12/11/03	DT	51132	8.12	15.82	10.04	1.7	48900	8.1	<0.44	<0.05	0.61	0.123	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	13	<2	5.5	<2	19			
DAPTLR	12/11/03	DF																			<1	<8	4.2	<2	5.6	<2	23			
DAPTLR	2/25/04	DT	39900	8.09	14.32	3.03																								
DAPTLR	2/27/04	DT	52699	7.97	14.52	2.17															<1	<8	5.9	<2	11	<2	11			
DAPTLR	2/27/04	DF																			<1	<8	3.7	<2	9	<2	12			
DAPTLR	5/21/04	DT																												
DAPTLR	5/24/04	DT					4.8	46900	8.1	<0.44	<0.05	0.24	0.123	<0.01	11	<10	<5	<5	<5	<5										
DAPTLR	6/2/04	DT	52240	8.1	21.16	7.86	2	46700	8.1	<0.44	<0.05	0.2	<0.0305	0.012	<10	<10	<5	<5	<5	<5	<1	<8	5.7	<2	7.9	<2	<10			
DAPTLR	6/2/04	DF																			<1	<8	**8.6**	<2	9.5	<2	14			
DAPTWB	12/11/03	DT	51052	8.07	15.57	9.35	3.7	48800	8	<0.44	0.061	0.64	<0.0305	<0.01	<10	<10	<5	<5	<5	<5	<1	<8	24	<2	6.7	<2	33			
DAPTWB	12/11/03	DF																			<1	<8	**10**	<2	7.7	<2	27			
DAPTWB	2/25/04	DT	43090	8.11	14.49	3.62																								
DAPTWB	2/27/04	DT	52355	7.99	14.64	2.35															<1	<8	6.4	<2	12	<2	19			
DAPTWB	2/27/04	DF																			<1	<8	**6.9**	<2	10	<2	20			
DAPTWB	5/21/04	DT																												
DAPTWB	5/24/04	DT					3.6	46700	8.1	<0.44	<0.05	0.2	0.123	<0.01	<10	<10	<5	<5	<5	<5										
DAPTWB	6/2/04	DT	52190	8.06	20.7	7.98	1.3	46700	8.1	<0.44	<0.05	0.23	<0.0305	0.011	<10	<10	<5	<5	<5	<5	<1	<8	15	<2	9.3	<2	40			
DAPTWB	6/2/04	DF																			<1	<8	**11**	<2	8.9	<2	19			
LB-2	1/21/04	ST	3043	8.08	17.49	11.05	5.2	3080	8.1	6.6	<0.05	0.88	0.829	0.254	<10	<10	<5	<5	<5	<5	<1	<8	9.2	<2	<4	<2	27			560
LB-2	1/21/04	SF	3043	8.08	17.49	11.05															<1	<8	**6.3**	<2	<4	<2	32			560

Location	Date	Type	Field Measurements				Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
			EC	pH	TEMP	DO																								
LB-2	1/28/04	DT					6.1	2710	8	7.5	<0.05	1.1	0.952	0.289	<10	<10	<5	<5	<5	<5	<1	<8	15	<2	<4	<2	26			
LB-2	1/28/04	DF																			<1	<8	**17**	<2	<4	<2	29			
LB-2	2/3/04	DT																			<1	<8	6.4	<2	<4	<2	22			
LB-2	2/3/04	DF																			<1	<8	**8.2**	<2	<4	<2	34			
LB-2	4/13/04	DT	2534	7.79	18.17	9.16	1.9	3020	8	5.3	<0.05	1.3	1.47	0.403	<10	<10	<5	<5	<5	<5										524
LB-3	1/21/04	ST	17875	8.24	13.19	11.37	1.5	19940	8.2	0.62	<0.05	0.38	0.215	0.095	<10	<10	<5	<5	<5	<5	<1	<8	2.2	<2	6.5	<2	18			2496
LB-3	1/21/04	SF	17875	8.24	13.19	11.37															<1	<8	2.7	<2	7.6	<2	27			2496
LB-3	1/28/04	DT					4.2	2530	8.6	0.97	<0.05	0.48	0.338	0.095	<10	<10	<5	<5	<5	<5	<1	<8	3.2	<2	<4	<2	25			
LB-3	1/28/04	DF																			<1	<8	3.2	<2	<4	<2	19			
LB-3	2/3/04	DT																			<1	<8	4.2	<2	<4	<2	<10			
LB-3	2/3/04	DF																			<1	<8	3.3	<2	<4	<2	15			
LB-3	4/13/04	DT	3006	8.31	16.28	12.3	0.9	3010	8.2	0.75	<0.05	0.68	0.123	0.08	<10	<10	<5	<5	<5	<5										824
SCM-1	7/30/03	DT	411	7.82	22.12	8.86	82	449	7.2	7.9	0.943	3.5	1.93	0.336	140	27	239	<5	<5	2310	<1	11	40	5.4	17	<2	160			102
SCM-1	7/30/03	DF																			<1	<8	**21**	<2	5.9	<2	100			
SCM-1	1/21/04	ST	3635	7.78	14.02	12.53	10	4070	7.9	15	0.114	1.5	1.17	0.14	11	<10	217	<5	<5	163	3.8	<8	13	<2	29	<2	48			1136
SCM-1	1/21/04	SF	3635	7.78	14.02	12.53															1.7	<8	**8.9**	<2	30	<2	46			1136
SCM-1	1/28/04	DT					9.1	2340	7.9	9.7	0.066	0.98	1.01	0.275	<10	<10	175	<5	<5	244	<1	<8	5.8	<2	9.9	<2	15			
SCM-1	1/28/04	DF																			<1	<8	**6.1**	<2	11	<2	38			
SCM-1	2/3/04	DT																			<1	<8	6.5	<2	12	<2	20			
SCM-1	2/3/04	DF																			<1	<8	4.4	<2	11	<2	48			
SCM-1	4/2/04	DT					6.5	3340	7.5	16	0.176	1.7	1.32	0.324	10	<10	52.7	<5	<5	211	1.5	<8	11	<2	19	<2	39			
SCM-1	4/2/04	DF																			1.2	<8	**9.5**	<2	19	<2	63			
SCM-1	4/13/04	DT	3582	7.76	16.46	9.85	5.9	4010	8	0.88	<0.05	0.65	0.154	0.037	13	<10	31.2	<5	<5	<5										1142
SJC-1	7/30/03	DT	3845	7.45	23.25	6.54	41	4390	7.6	4.8	0.328	2	0.857	0.117	64	14	76	<5	<5	482	1.5	<8	9.5	2.8	7.6	<2	57			758
SJC-1	7/30/03	DF																			<1	<8	3.5	<2	5.7	<2	78			
SJC-1	1/21/04	ST	2461	8.17	13.91	14.61	1.4	2330	8.2	1.4	<0.05	0.49	0.338	<0.01	<10	<10	<5	<5	<5	<5	1.6	<8	<2	<2	14	<2	<10			748
SJC-1	1/21/04	SF	2461	8.17	13.91	14.61															1.6	<8	**8.7**	<2	14	<2	24			748
SJC-1	1/28/04	DT					4.9	2320	7.8	2.5	<0.05	0.63	0.0921	0.014	<10	<10	85.7	<5	<5	256	<1	<8	2.2	<2	<4	<2	<10			
SJC-1	1/28/04	DF																			<1	<8	3.5	<2	<4	<2	33			

Location	Date	Type	Field Measurements				Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
			EC	pH	TEMP	DO																								
SJC-1	2/3/04	DT																			1.9	<8	8.6	<2	17	<2	30			
SJC-1	2/3/04	DF																			1.3	<8	3	<2	12	<2	100			
SJC-1	4/2/04	DT					57	1480	7.6	7	0.095	<0.2	0.583	0.072	81	11	61.7	<5	<5	62.2	<1	<8	7.4	<2	12	<2	30			
SJC-1	4/2/04	DF																			<1	<8	3.6	<2	8.5	<2	64			
SJC-1	4/13/04	DT	2759	7.11	16.84	8.09	0.8	3190	7.9	11	<0.05	1.6	1.2	0.231	<10	<10	<5	<5	<5	<5										962

Table C-11.21. Summary of the Number of Acute CTR Exceedances at the Ambient Coastal Monitoring Stations

			Freshwater					Saltwater			
		Sample Size	Acute					Acute			
Station	Channel	Acute	Cd	Cu	Cr	Pb	Ni	Cd	Cu	Pb	Ni
ACM-1	Aliso Creek Mouth	4		1					1		
DAPTBD	Dana Point Harbor at bay dock	2									
DAPTDC	Dana Point Harbor Dana Cove	3									
DAPTEB	Dana Point Harbor East Basin	3									
DAPTLR	Dana Point Harbor near boatyard	3		1					1		
DAPTWB	Dana Point Harbor West Basin	3									
LB-2	Laguna Beach Marine Life Refuge Drain 2	3		3					3		
LB-3	Laguna Beach Marine Life Refuge Drain 3 (Lag Cyn Wash)	3									
SCM-1	Salt Creek Mouth	5		4					4		
SJC-1	San Juan Creek Mouth	5		1							
	Totals	34	0	10	0	0	0	0	9	0	0

Table C-11.22. Targeted Dry Weather Reconnaissance Sites Exceeding Regional Tolerance Interval on Consecutive Sampling Dates

City	Site	Location	Parameter
Aliso Viejo	AVJ01P27	Off Pacific Park and Woodfield	Ammonia as N Reactive phosporus as P
	AVJ01P28	Upstream of P27, next to Clear Creek system	Ammonia as N Dissolved oxygen Reactive phosphorus as P Total coliform
County of Orange	COL11P01	Along Tijeras Creek, off Antonio Parkway before Tijeras Avenue	Chlorpyrifos
Dana Point	DP@SA	V-ditch at end of parking lot	Ammonia as N Fecal coliform Reactive phosphorus as P Turbidity
Laguna Niguel	LNJ03TBNGL	Downstream of Golden Lantern/Moulton	Ammonia as N
	LNJ04@J03	Confluence of J03 and J04 in Laguna Niguel Regional Park	Chlorpyrifos
	LNL03P06	Upstream of Camino Capistrano and railroad	Total chlorine
Lake Forest	LFJ01P05	Off Muirlands and Los Alisos	Reactive phosphorus as P
Mission Viejo	MVJ01P03	Off Charlinda and Alicia	Dissolved oxygen
San Clemente	SCBS@M02	Intersection of Pico and Calle Los Molinos	Dissolved oxygen Enterococcus Hardness

Table C-11.23 Sediment Chemistry and Toxicity Results From Dana Point Harbor

Station Code	Date	Sediment Toxicity	% clay	% silt + clay	Total Nitrogen	Total Phosphorus	Cadmium	Chromium	Copper	Lead	Nickel	Silver	Zinc	Iron	Org. Carbon	4,4-DDD	4,4-DDE	4,4-DDT	alpha-BHC	beta-BHC	Chlordane	PCB-1254	PCB-1260	Malathion	Simazine	2,4,5-TP	2,4-D
		% Survival			mg/Kg										%	µg/kg											
		Eohaustorius																									
Dana Point Harbor																											
DAPTEB	11/7/03	29	7.72	44.87	667	288	0.98	14.2	57.8	14.4	7.89	<0.50	98.5	8100	1.76	<5	3e	<5	<4	<3	20e	<30	<30	<20	<80	<110	<800
DAPTEB	5/21/04	27	34.02	100	787	317	<0.50	15.9	102	15.3	8.86	<0.50	125	10400	2.21	<5	<4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTBY	11/7/03	79	20.42	92.42	612	403	0.43	16.0	46.3	4.06	8.15	<0.50	77.1	11000	0.86	<5	3e	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTBY	5/21/04	73	19.72	100	561	401	<0.50	15.7	49	6.9	8.39	<0.50	79.7	12100	1.03	<5	<4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTLB	11/7/03	59	18.63	64.57	629	384	<0.50	17	73.5	6.39	7.97	<0.50	86.6	11300	1.71	<5	3e	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTLB	5/21/04	77	16.67	100	728	447	<0.50	17.9	86.4	10.2	8.73	<0.50	96.2	13800	1.32	<5	<4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTWB	11/7/03	78	17.90	50.01	835	312	<0.50	13.4	92.9	9.39	6.54	<0.50	98.4	8330	1.62	<5	4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTWB	5/21/04	60	34.34	100	873	272	<0.50	14.6	95.7	15	7.15	<0.50	96.3	9380	3.13	<5	<4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTDC	11/7/03	87	25.47	100	395	369	<0.50	13.4	18.7	1.43	6.96	<0.50	36.4	6430	0.57	<5	3e	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800
DAPTDC	5/21/04	69	1.29	22.16	631	456	<0.50	19.8	38.9	7.47	10.1	<0.50	62.3	10300	1.31	<5	<4	<5	<4	<3	<25	<30	<30	<20	<80	<110	<800

Above NOAA Effects Range Median (ERM) concentration

Anthropogenically Enriched - 99% Confidence using SCCWRP Iron Normalization Database

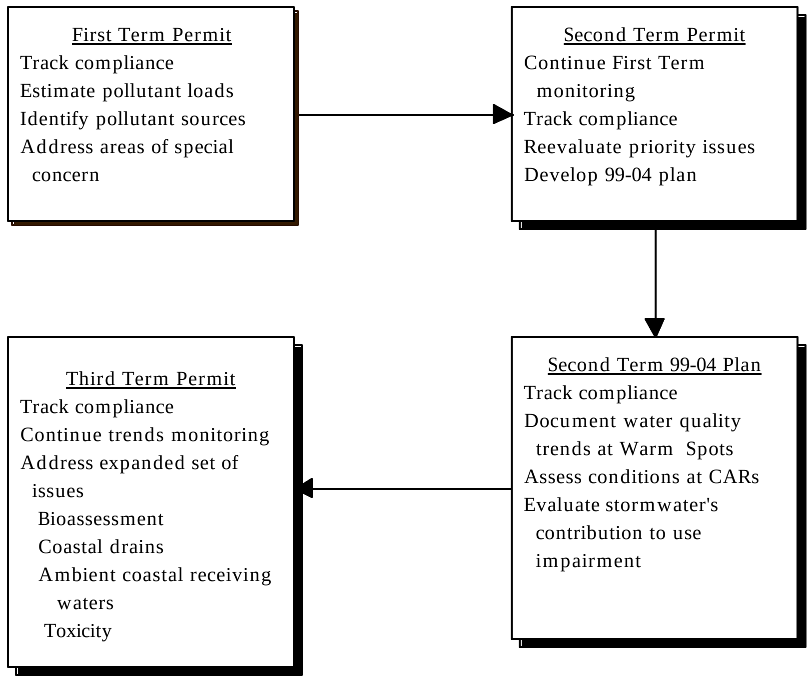
All organic compounds unless otherwise noted were below the detection limits of the laboratory.

Table C-11.24 Benthic Infaunal Community Analysis From Dana Point Harbor

Index	11/03/03	05/04/04	11/03/03	05/04/04	11/03/03	05/04/04	11/03/03	05/04/04	11/03/03	05/04/04
	DAPTLB	DAPTLB	DAPTDC	DAPTDC	DAPTEB	DAPTEB	DAPTBY	DAPTBY	DAPTWB	DAPTWB
Number of species	23	23	32	35	23	34	21	33	23	22
Total count	170	164	145	420	108	1287	77	320	271	452
Shannon-Wiener diversity index	2.42	2.39	2.94	2.59	2.66	2.06	2.37	2.60	2.25	1.85
Margalef diversity index	4.28	4.31	6.23	5.63	4.70	4.61	4.60	5.55	3.93	3.43
Evenness	0.77	0.76	0.85	0.73	0.85	0.58	0.78	0.74	0.72	0.60
Dominance index	6	6	11	9	9	5	7	7	6	4

	11/03/03		05/04/04	
Station	**BRI**	**Response**	**BRI**	**Response**
DAPTBY	40.40	Level I	43.97	Level II
DAPTDC	26.98	Ref	28.54	Level I
DAPTEB	49.07	Level II	48.69	Level II
DAPTLB	47.64	Level II	38.56	Level I
DAPTWB	49.50	Level II	48.74	Level II

Figure C-11.1. Receiving Waters Monitoring Program Evolution



Warm spots refers to sites with pollutant levels that are elevated relative to the long-term County average (see Section 2.2.2 for more detail).
CARs refers to critical aquatic resources, sites with greater beneficial use potential (see Section 2.2.2 for more detail).

Figure C-11.2. Comparison of IBI Scores Over the Period 2002 - 2004

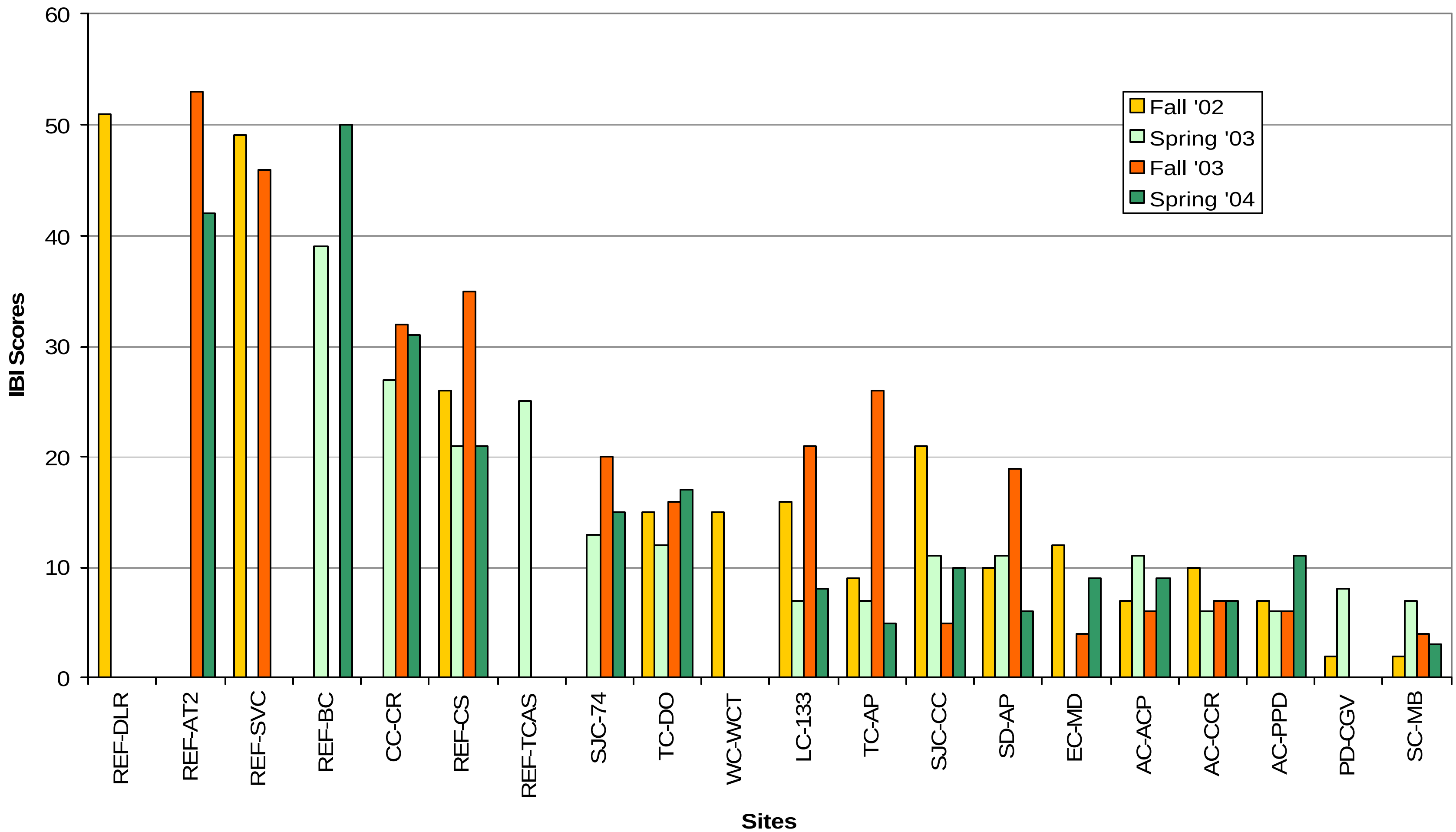


Figure C-11.3. Annual Precipitation Totals Across the County

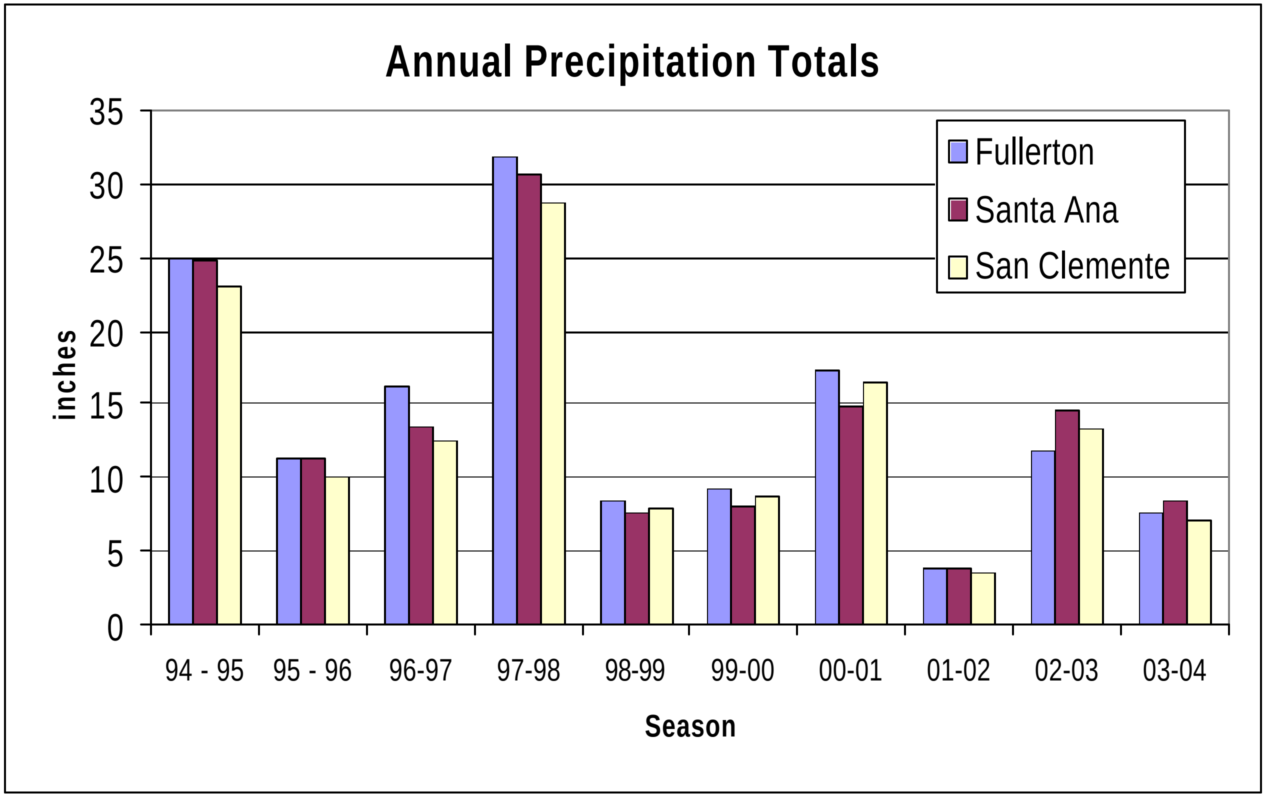


Figure C-11.4. Bioassessment Sites Ranked by IBI Scores, Fall 2003

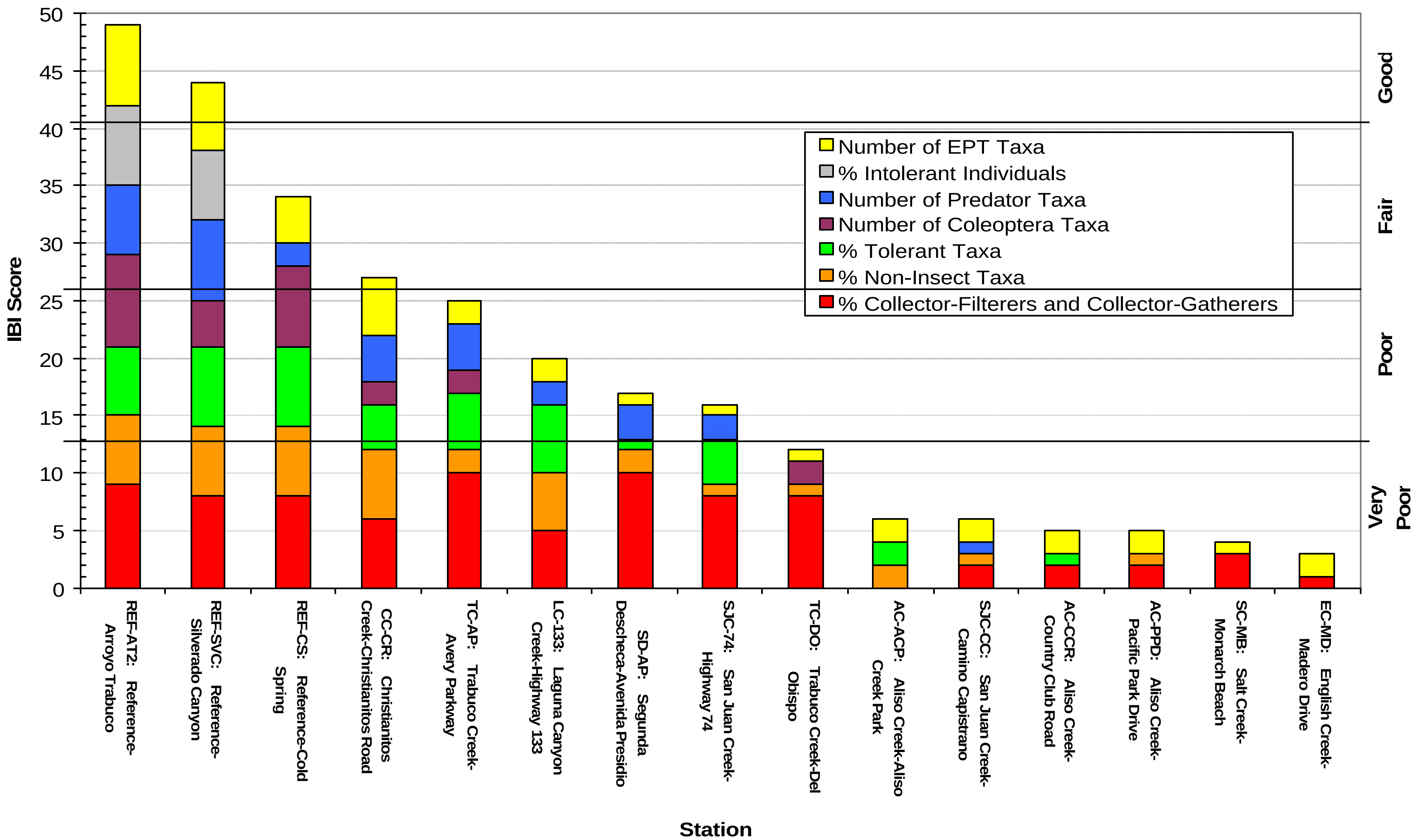


Figure C-11.5. Bioassessment Sites Ranked by IBI Scores, Spring 2004

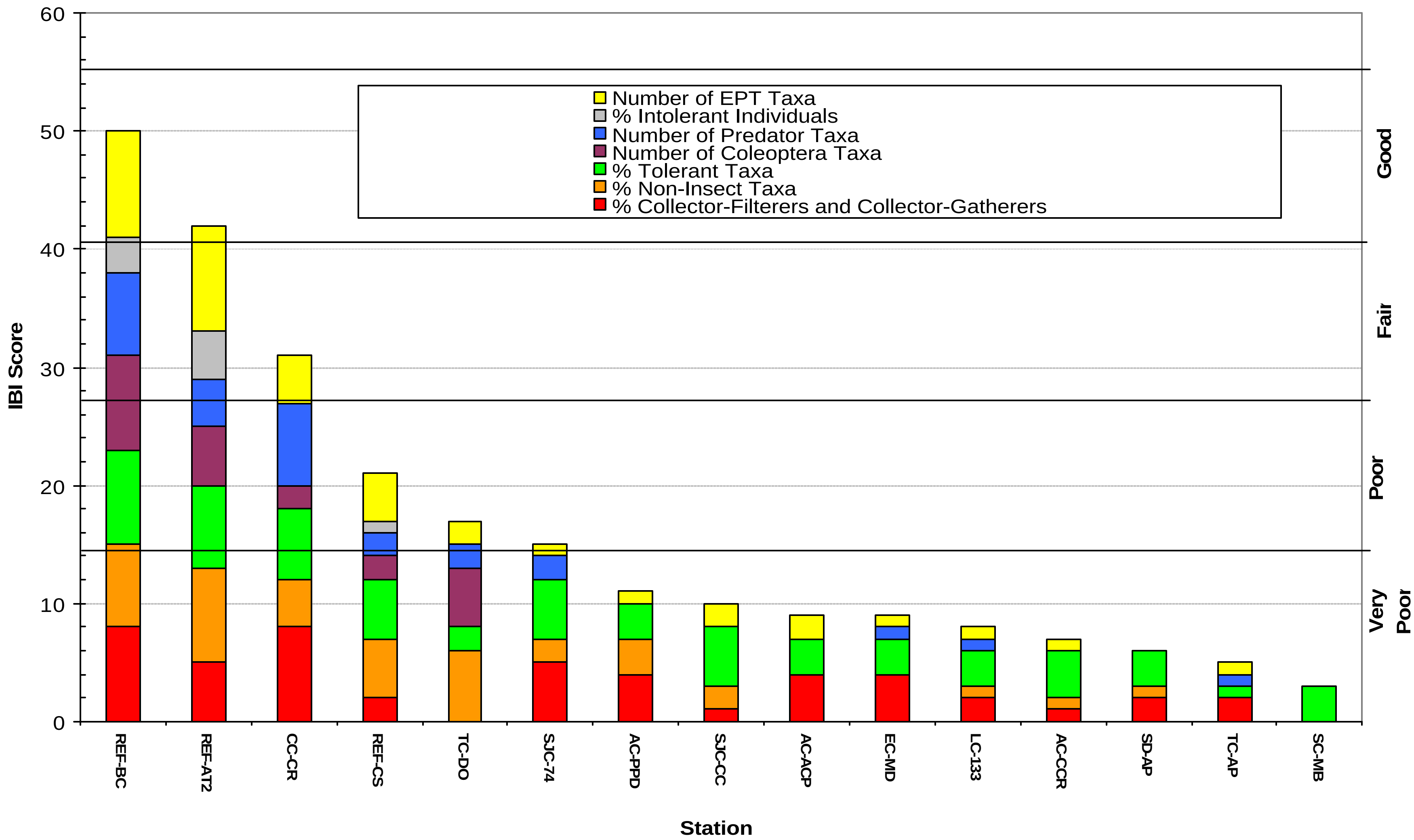


Figure C-11.6a. Relationship Between Stormdrain and Receiving Water Concentrations of Fecal Coliform at Laguna Cyn Channel Mouth

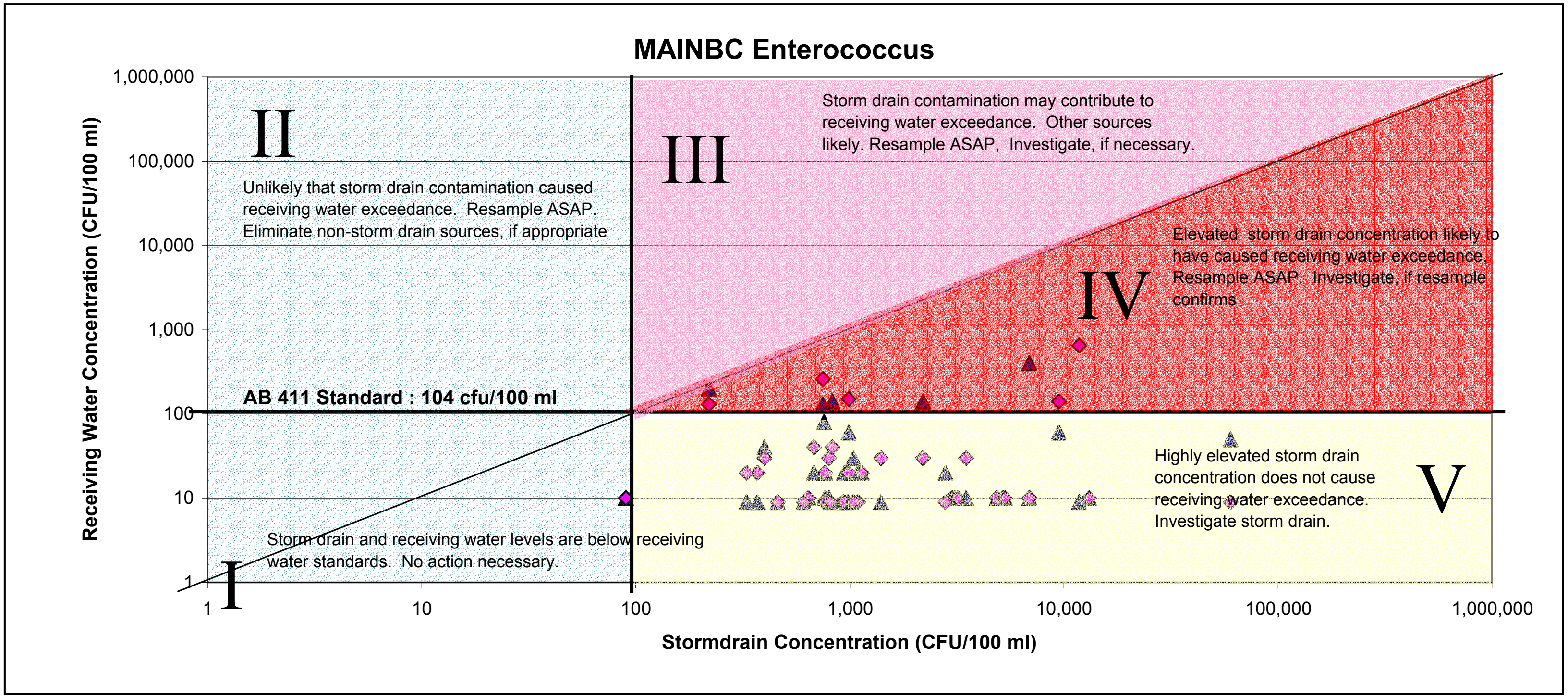


Figure C-11.6b. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Aliso Creek Mouth

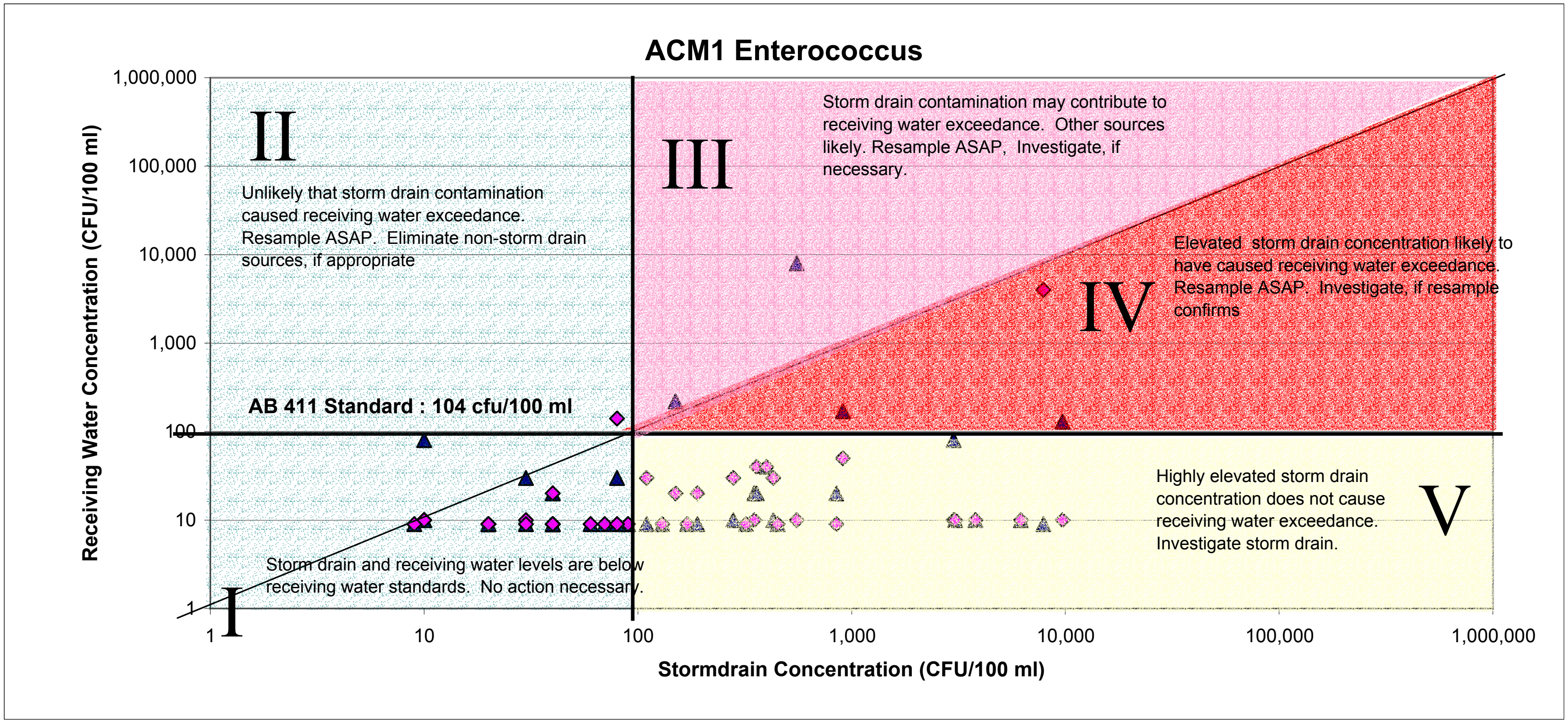


Figure C-11.6c. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Salt Creek Mouth

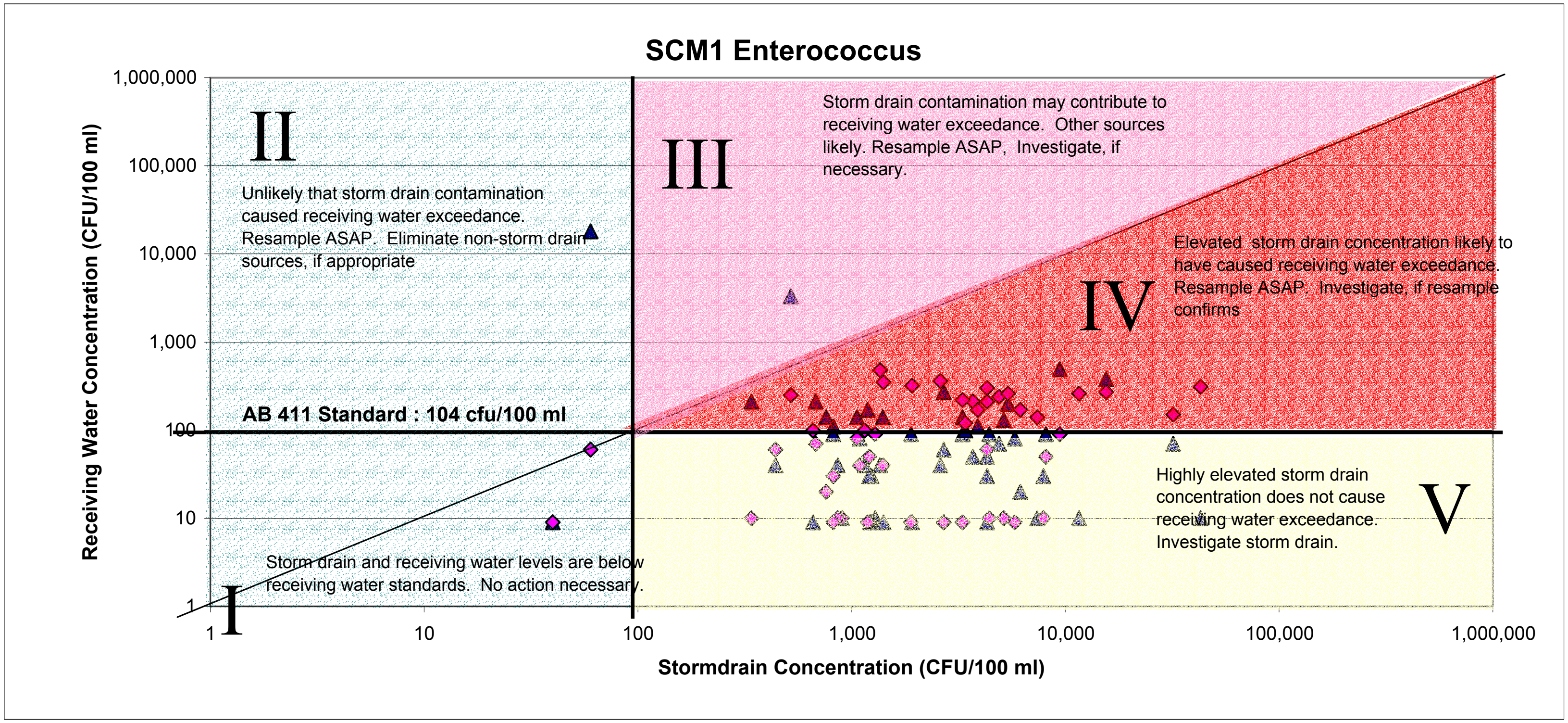


Figure C-11.6d. Relationship Between Stormdrain and Receiving Water Concentrations of Fecal Coliform at Salt Creek Mouth

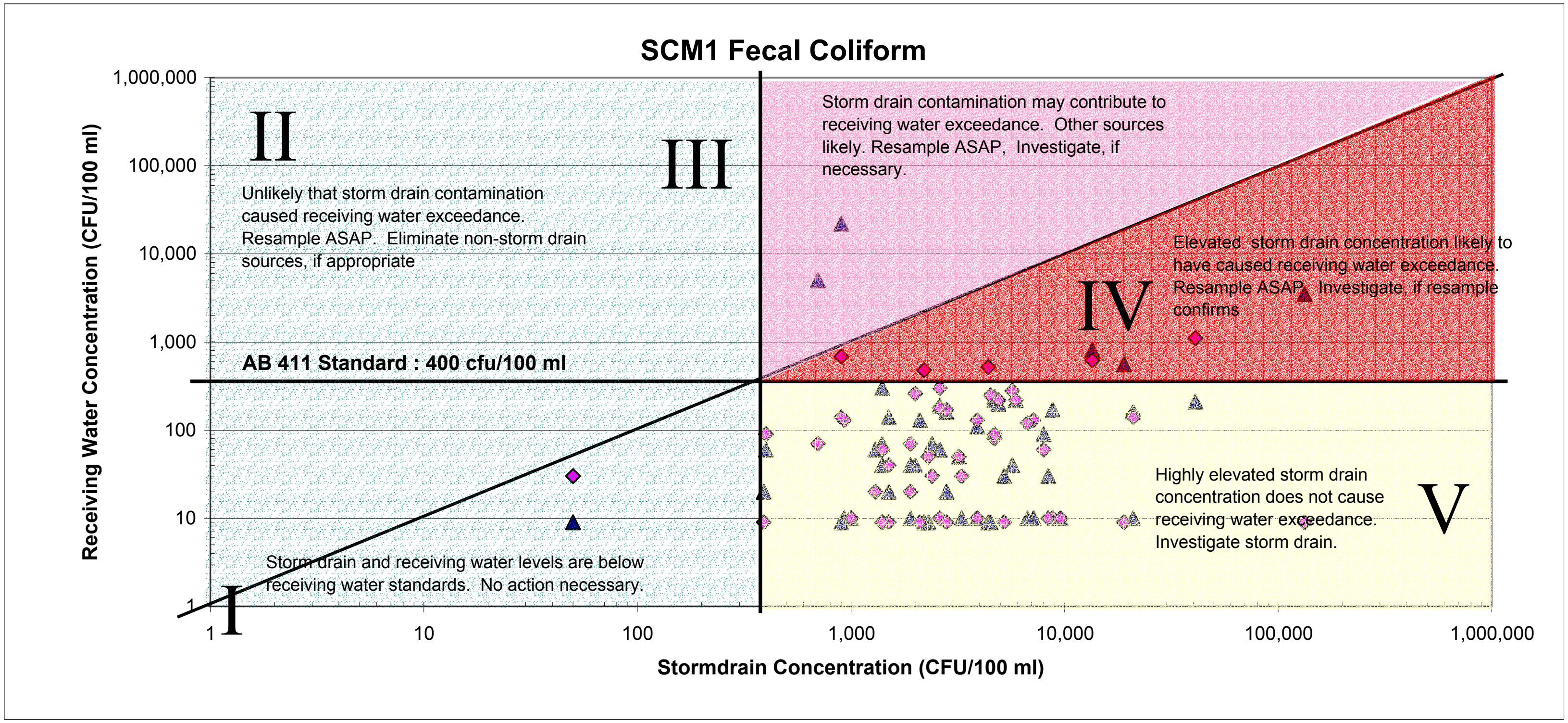


Figure C-11.6e. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Doheny State Beach

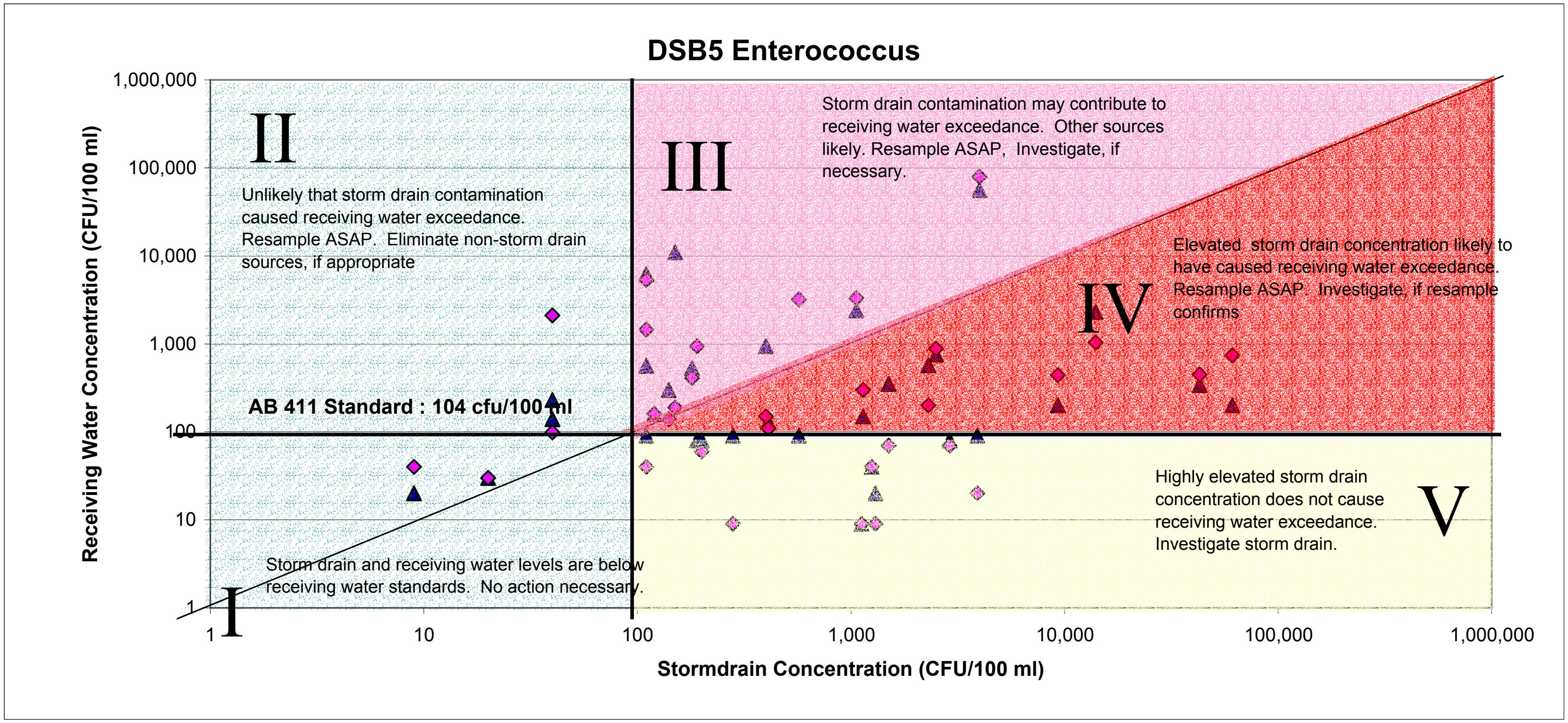


Figure C-11.6f. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at San Juan Creek Mouth

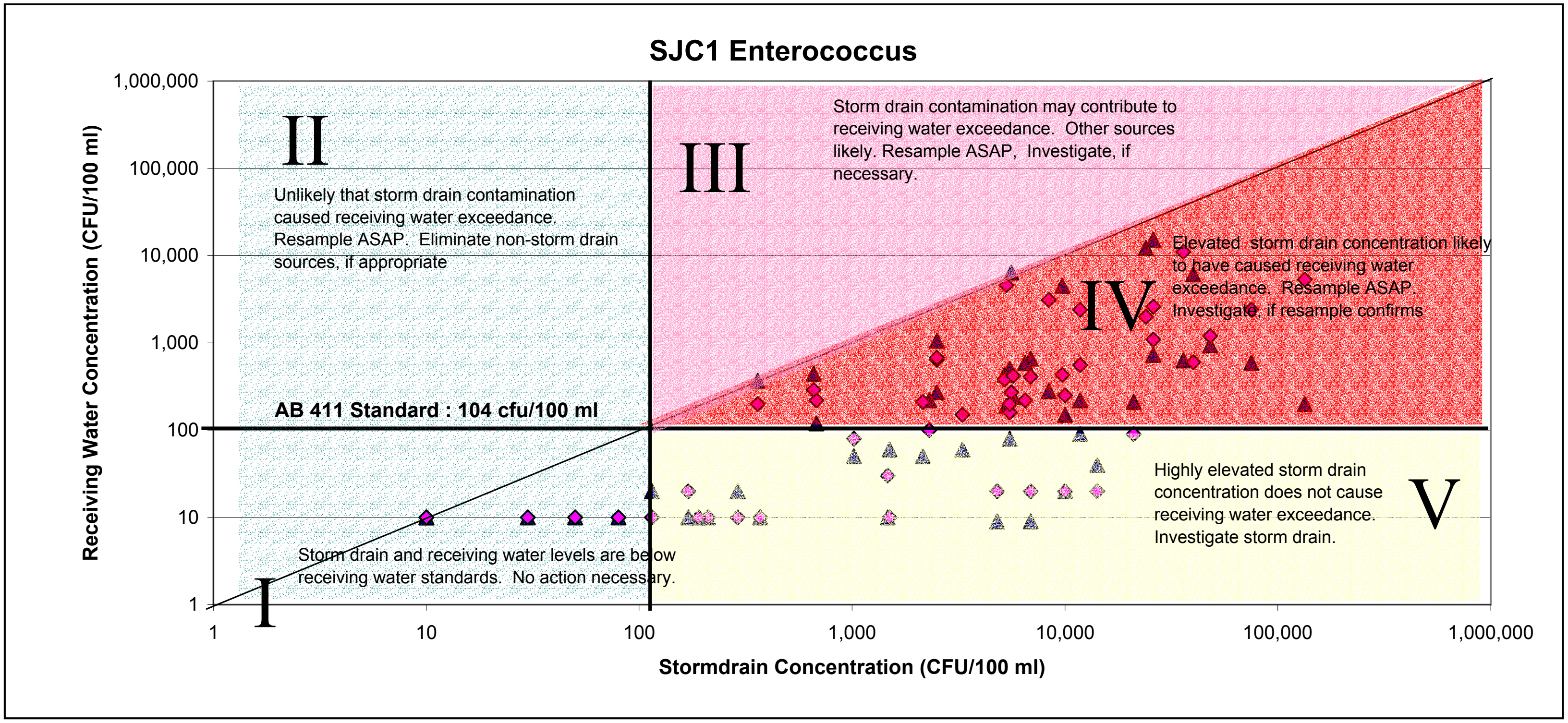


Figure C-11.6g. Relationship Between Stormdrain and Receiving Water Concentrations of Fecal Coliform at San Juan Creek Mouth

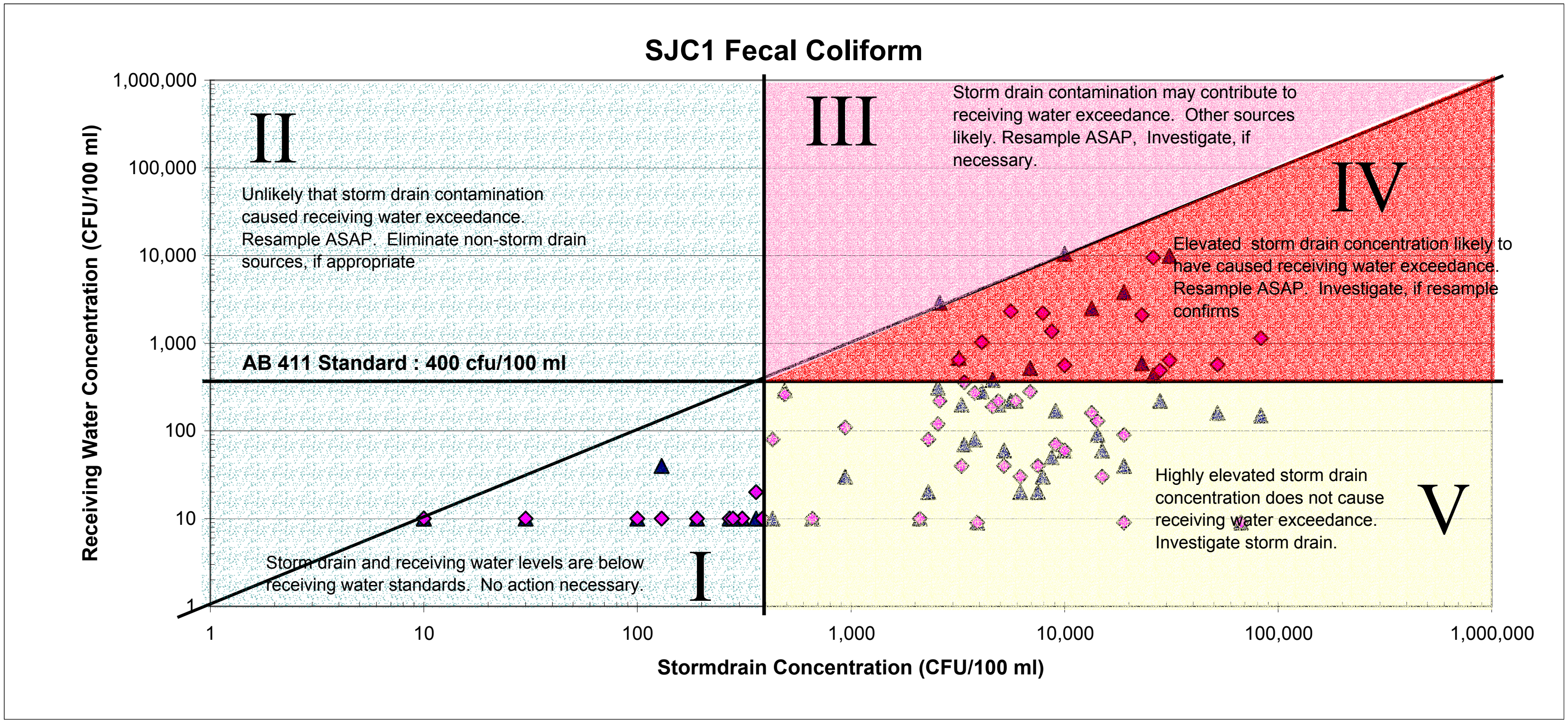


Figure C-11.6h. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Doheny Beach Storm Drain

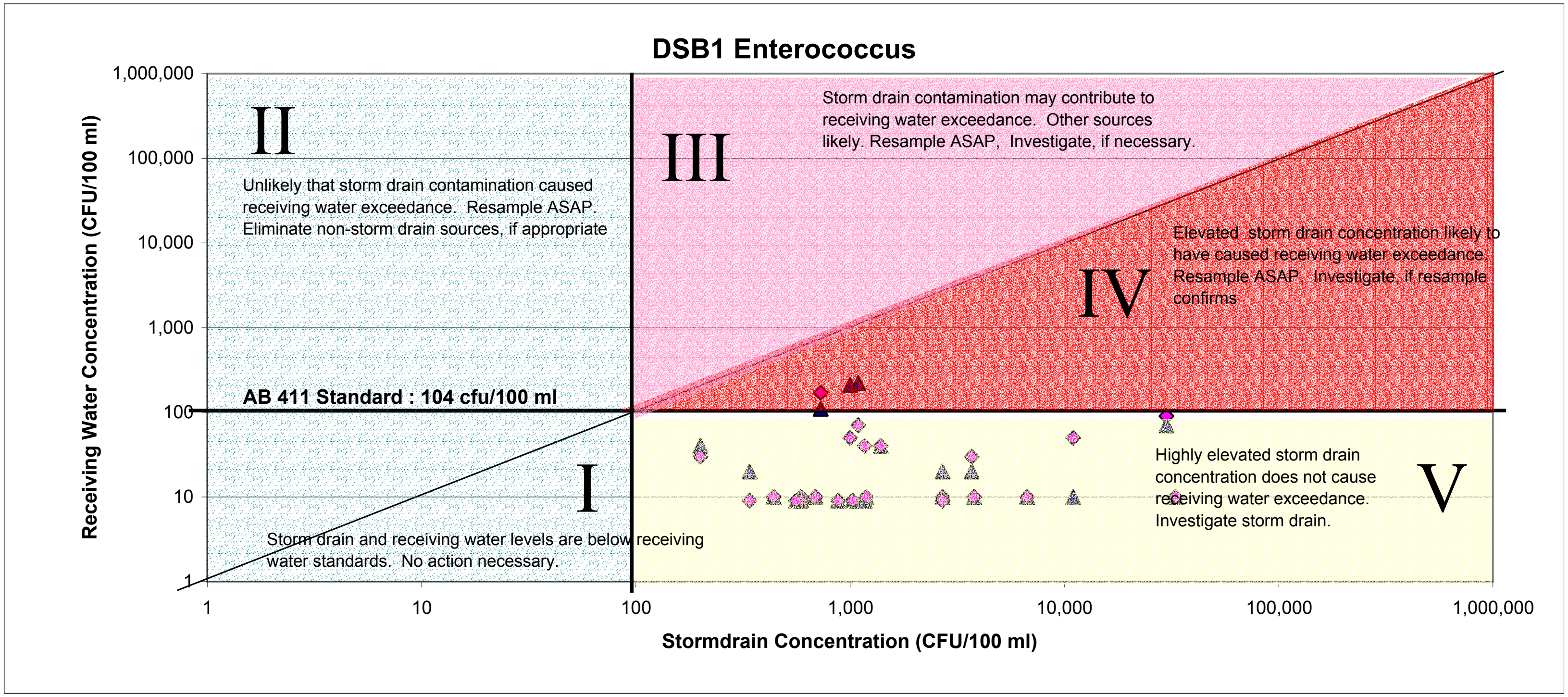


Figure C-11.6i. Relationship Between Stormdrain and Receiving Water Concentrations of Fecal Coliform at Doheny State Beach

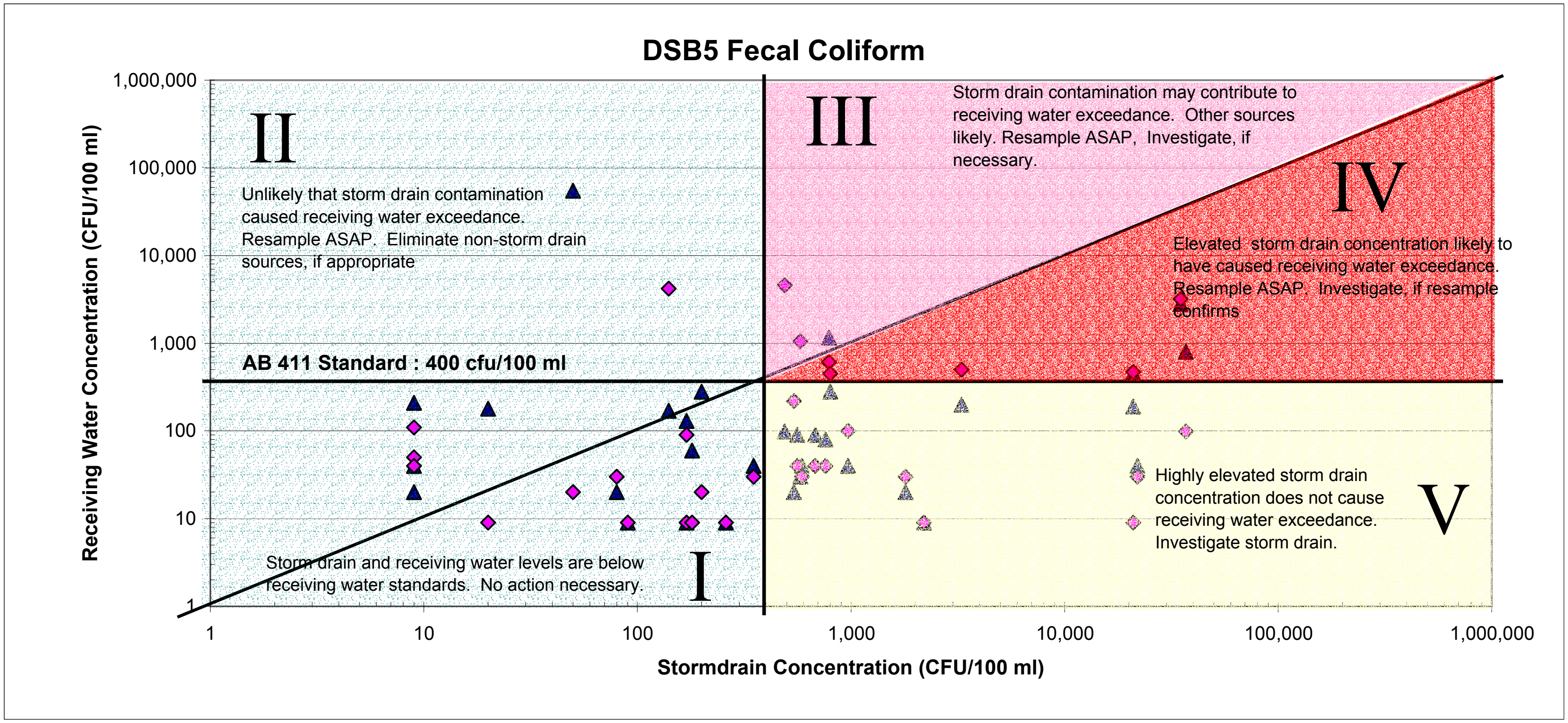


Figure C-11.6j. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Capistrano Beach

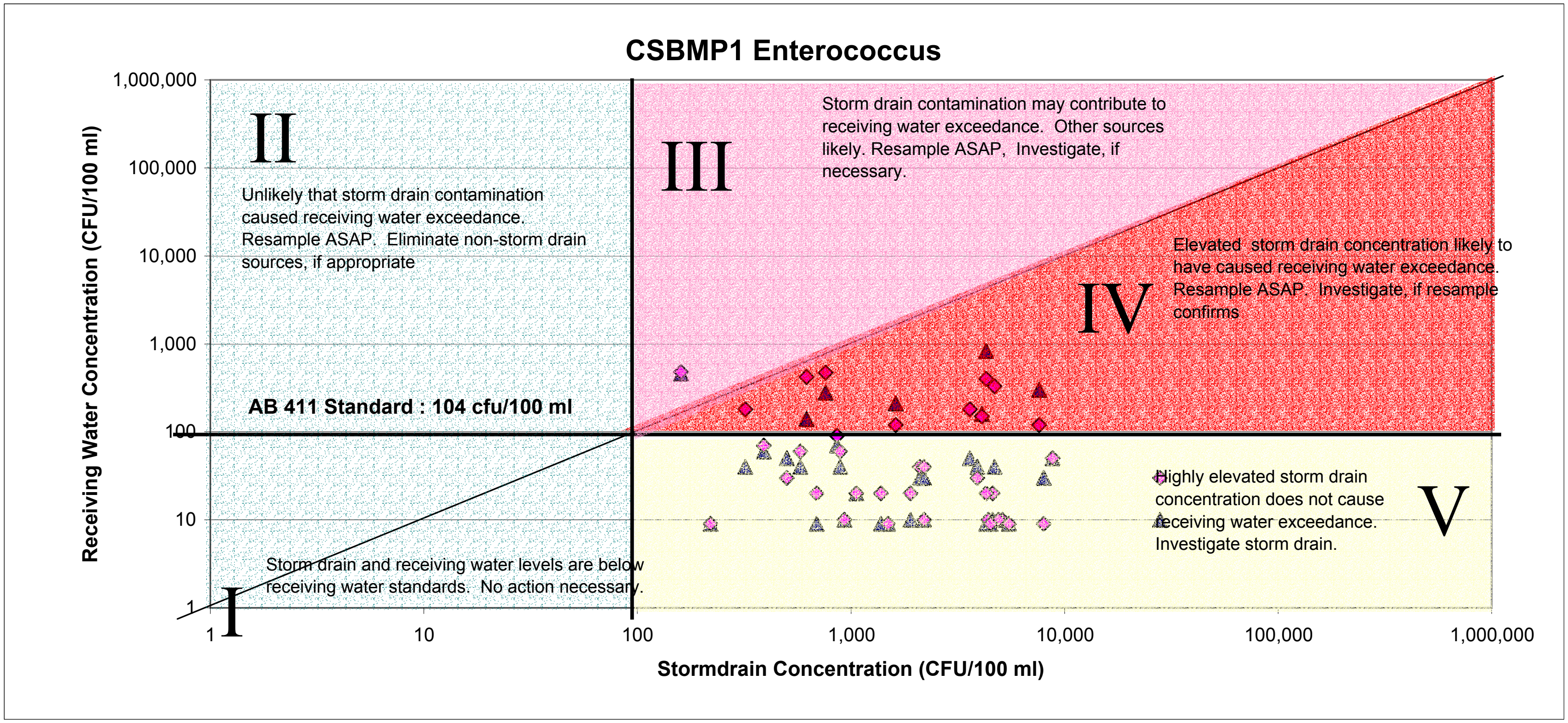


Figure C-11.6k. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Capistrano Beach

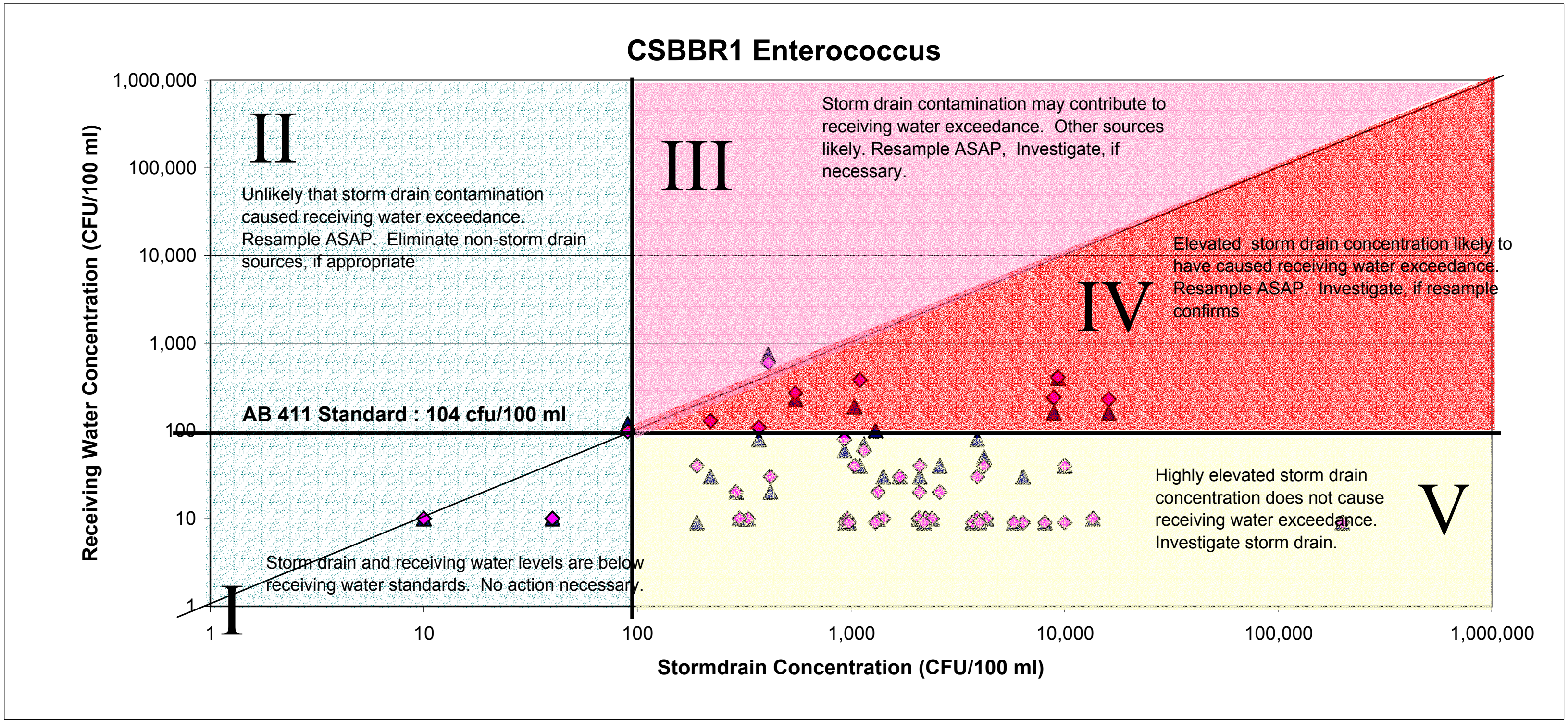


Figure C-11.6I. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Poche Beach

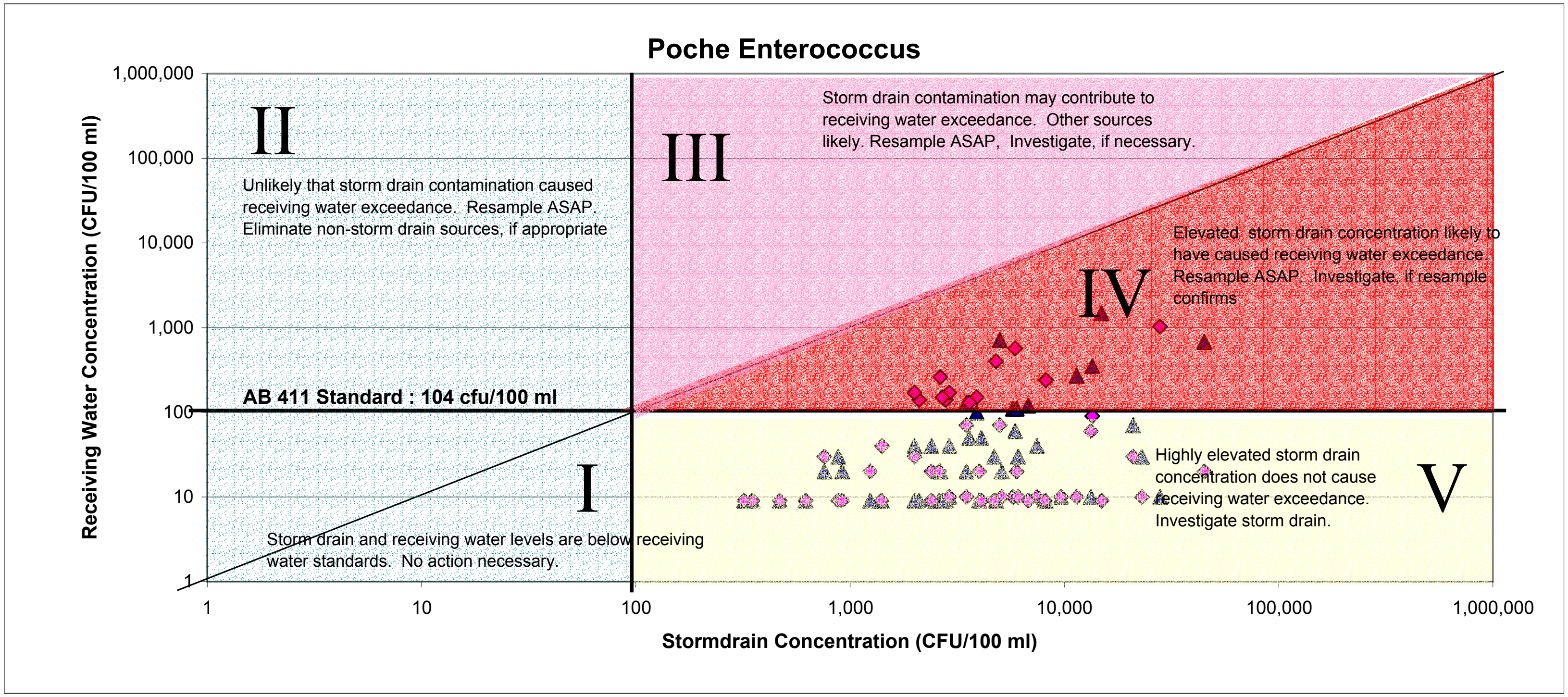


Figure C-11.6m. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at Pico

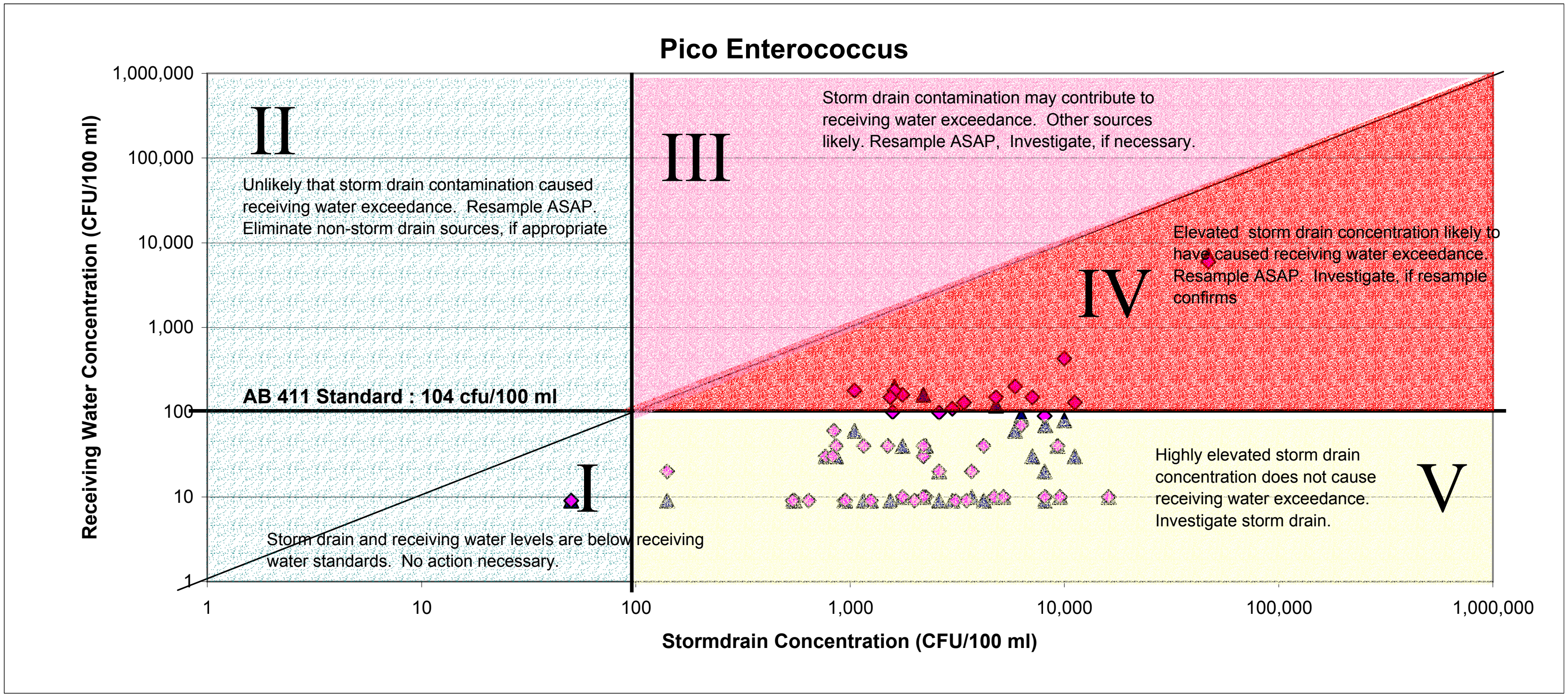


Figure C-11.6n. Relationship Between Stormdrain and Receiving Water Concentrations of Enterococcus at San Clemente Pier

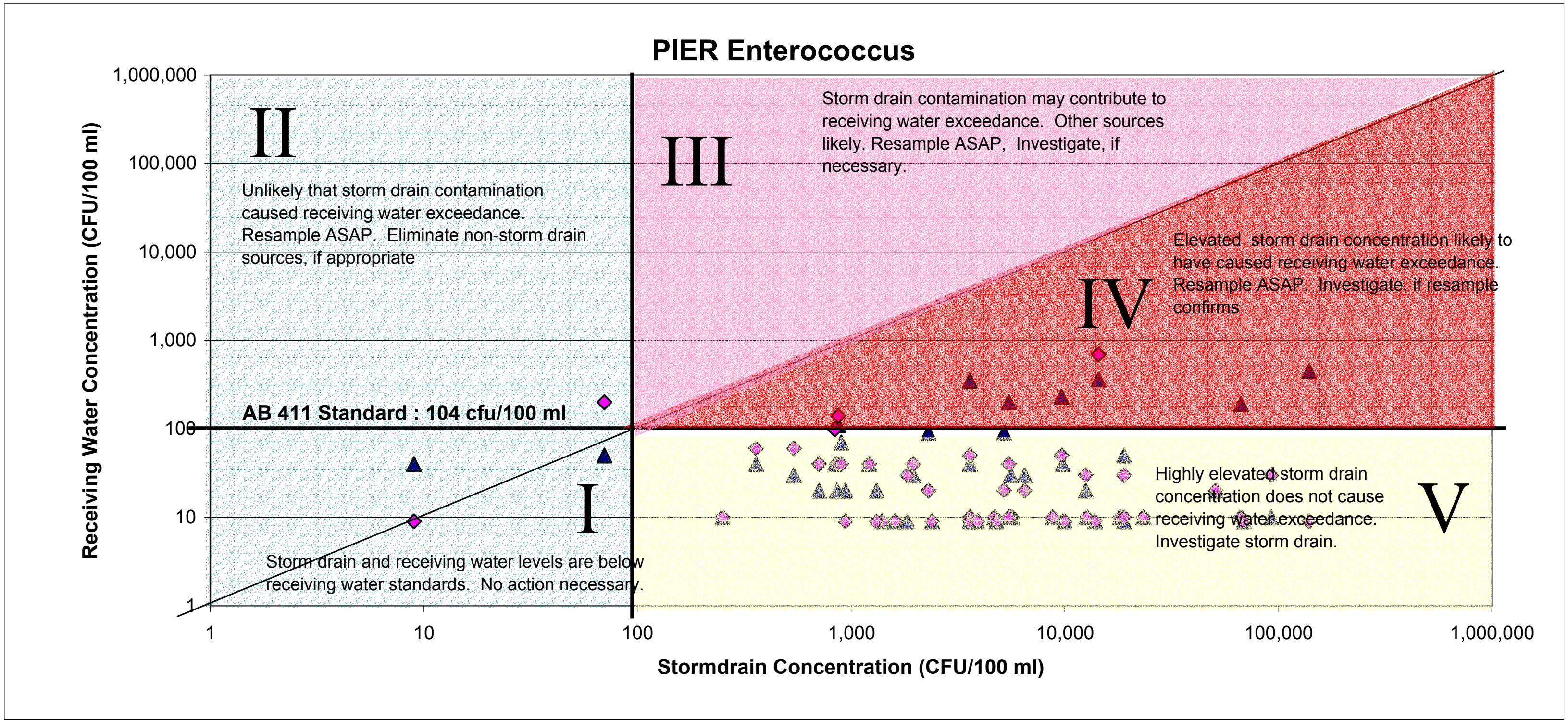


Figure C-11.7.a. Representative Plots of Dry Weather Data From Random Sites – Ammonia as N

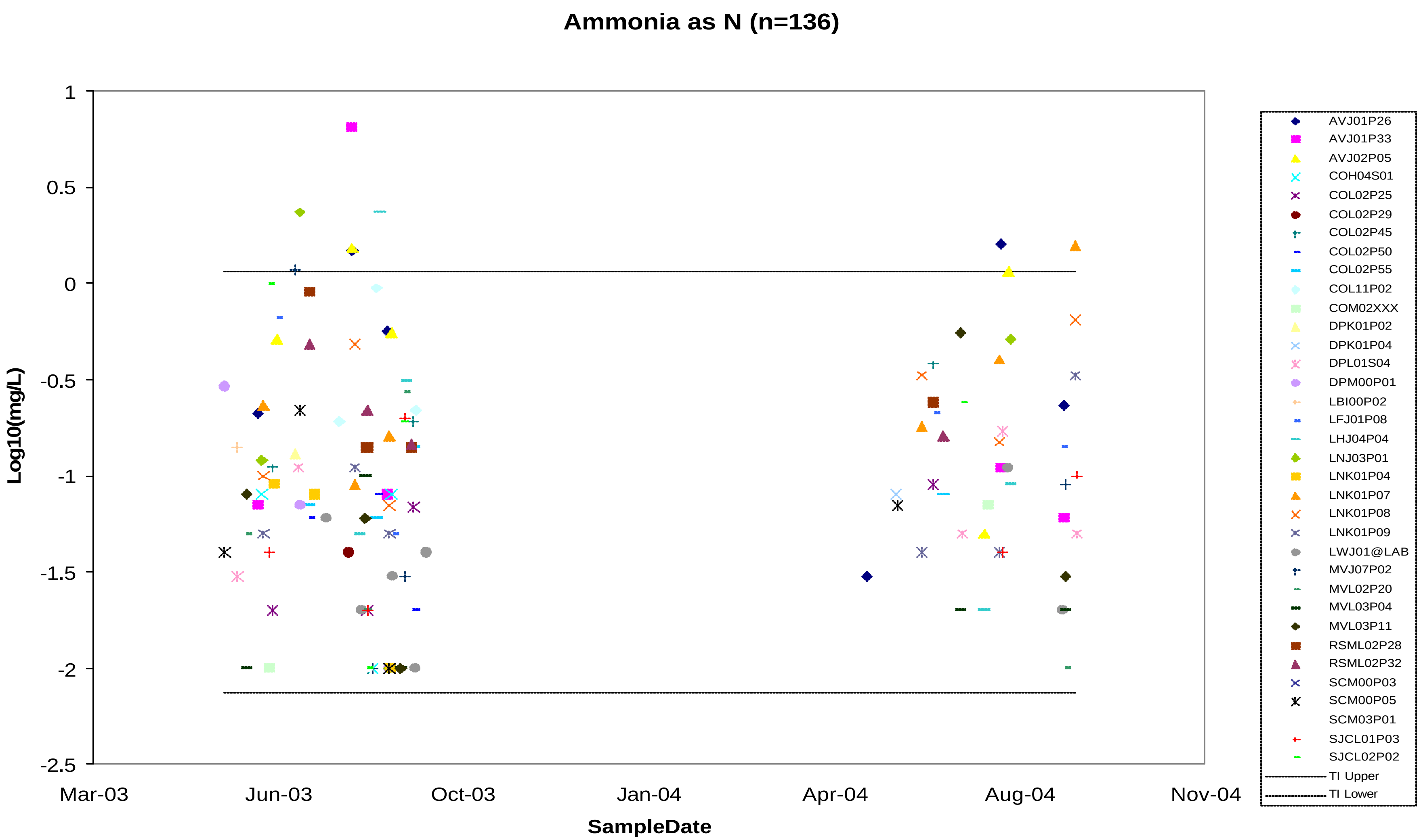


Figure C-11-7.b. Representative Plots of Dry Weather Data From Random Sites – Chlorpyrifos

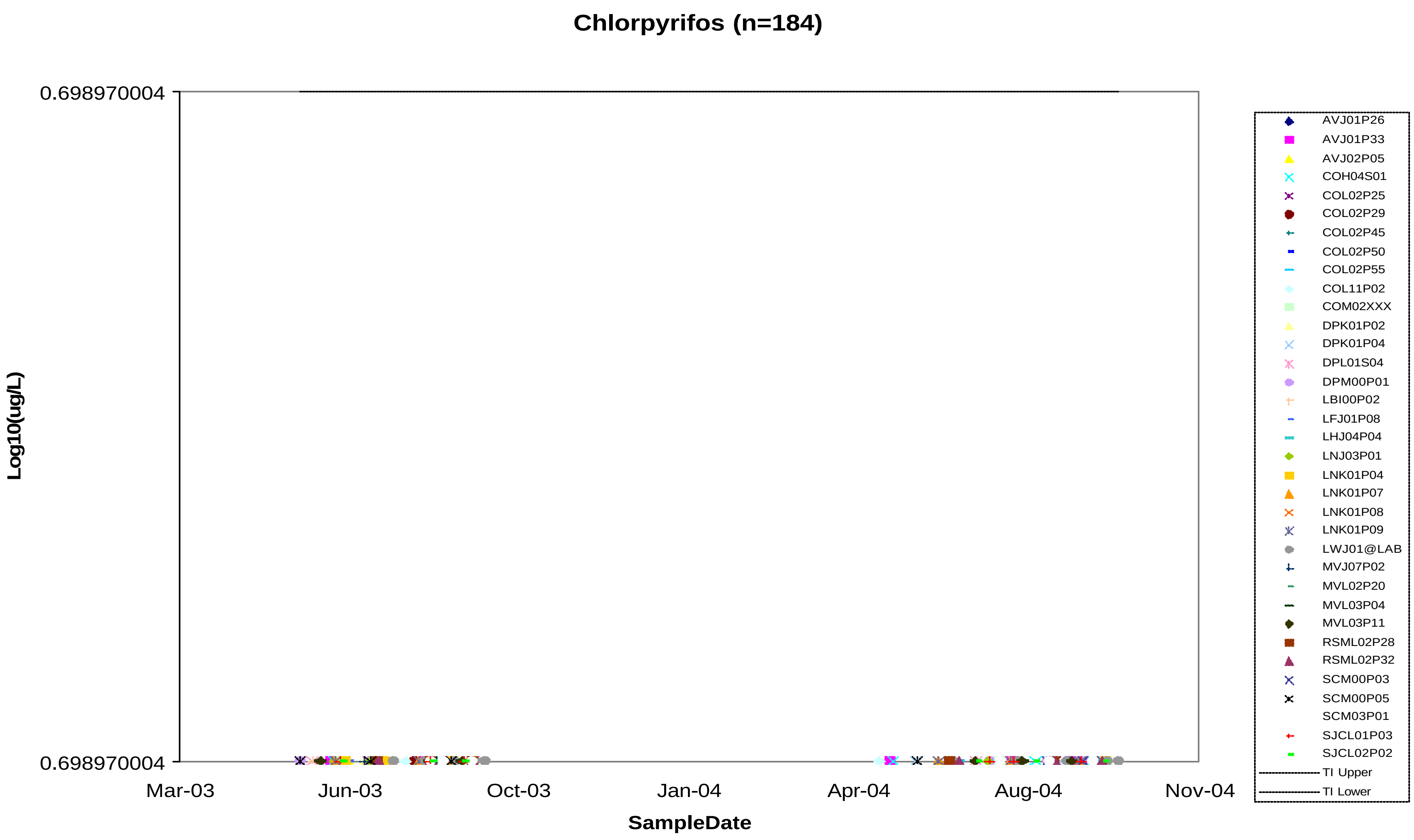


Figure C-11.7.c. Representative Plots of Dry Weather Data From Random Sites – Copper

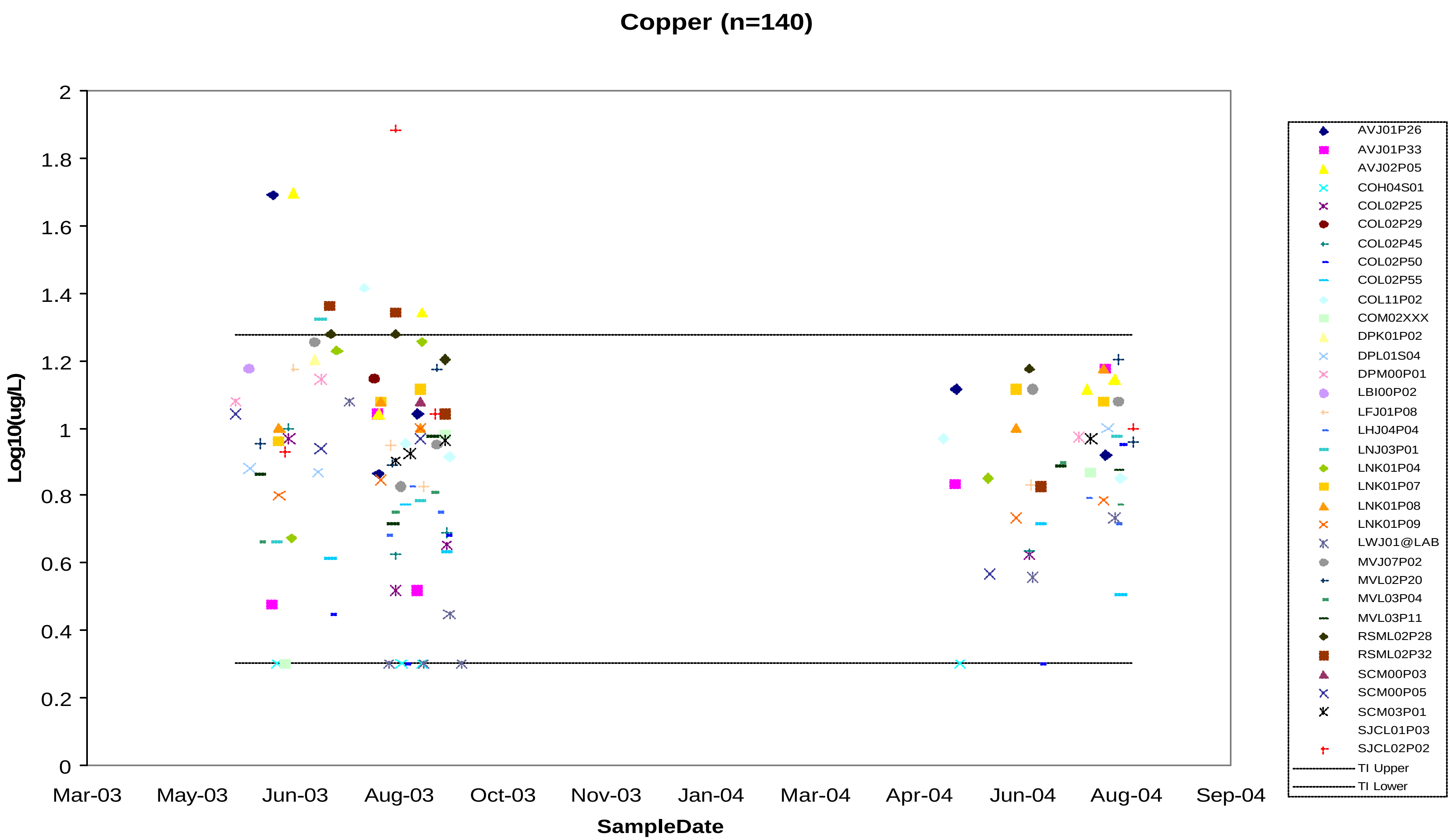


Figure C-11-7.d. Representative Plots of Dry Weather Data From Random Sites – Diazinon

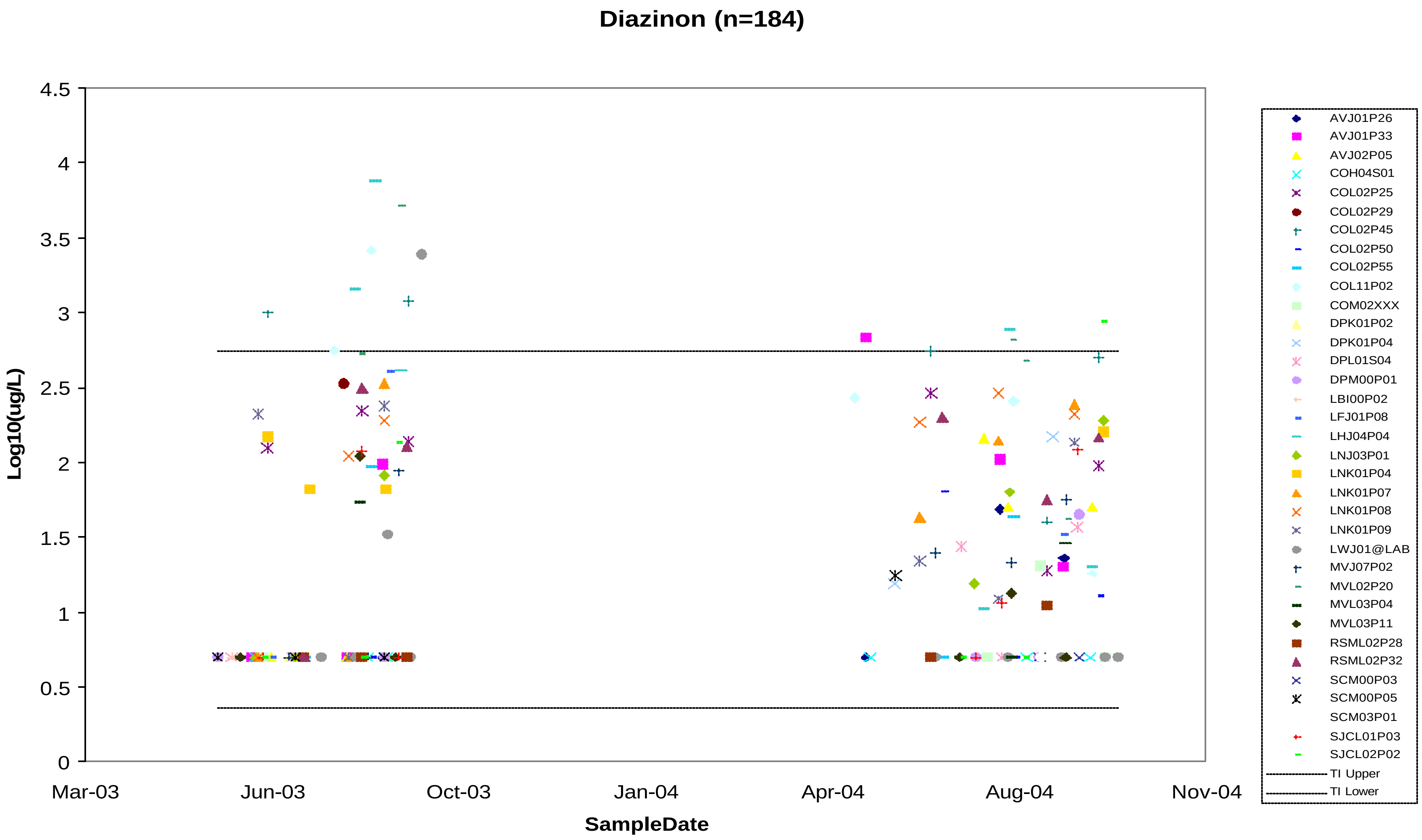


Figure C-11.7.e. Representative Plots of Dry Weather Data From Random Sites – Dissolved Oxygen

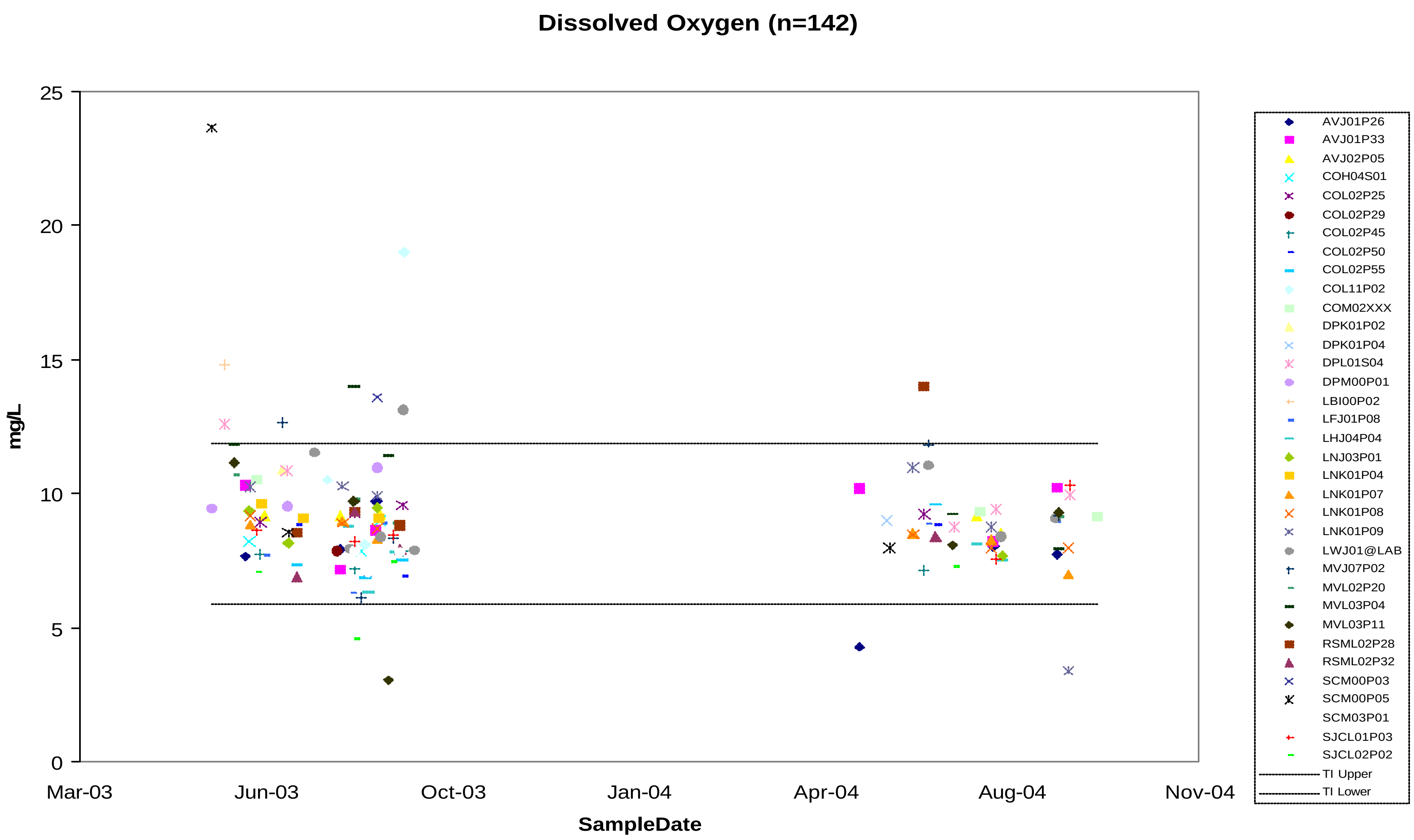


Figure C-11-7.f. Representative Plots of Dry Weather Data From Random Sites – Reactive Phosphorus

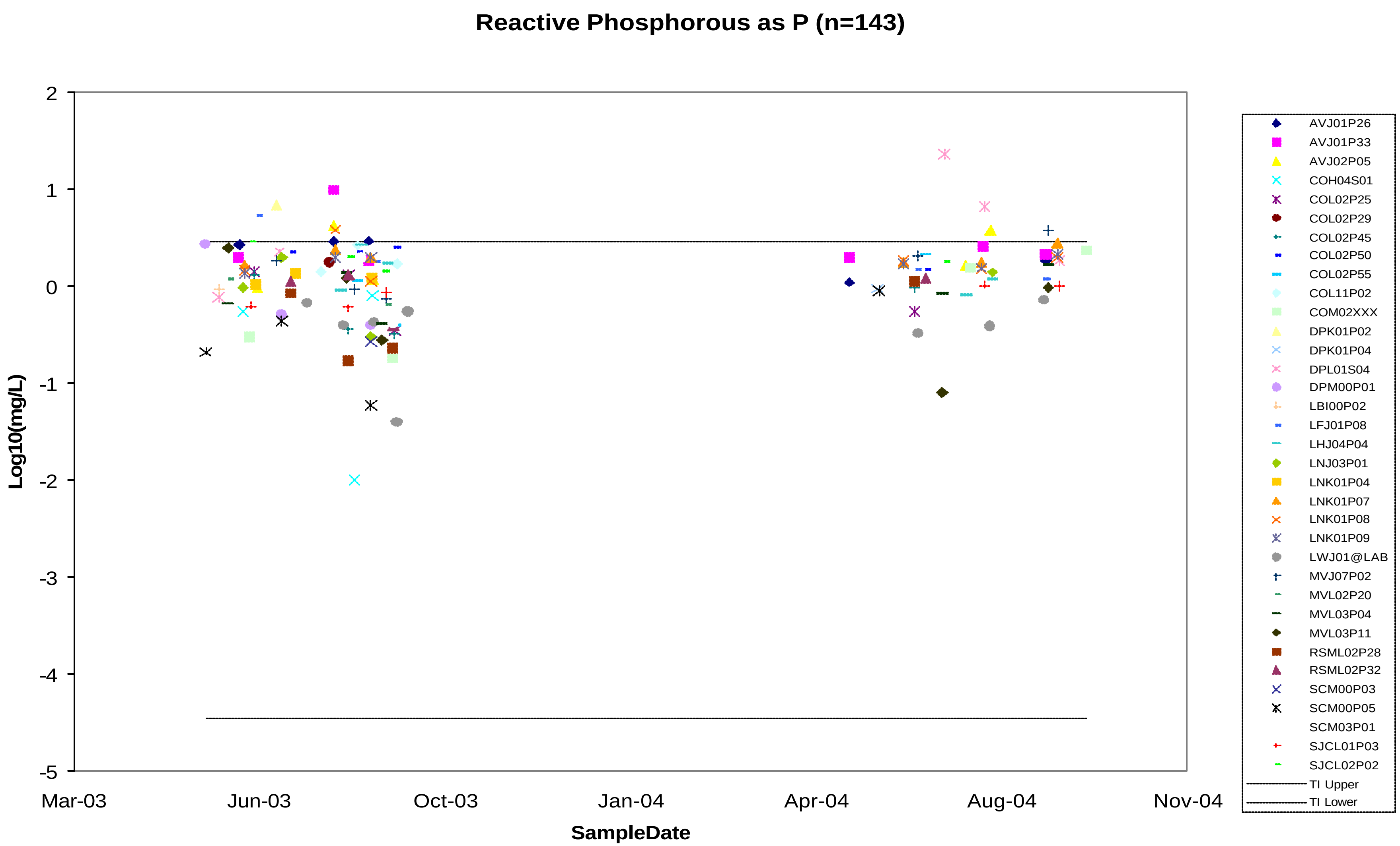
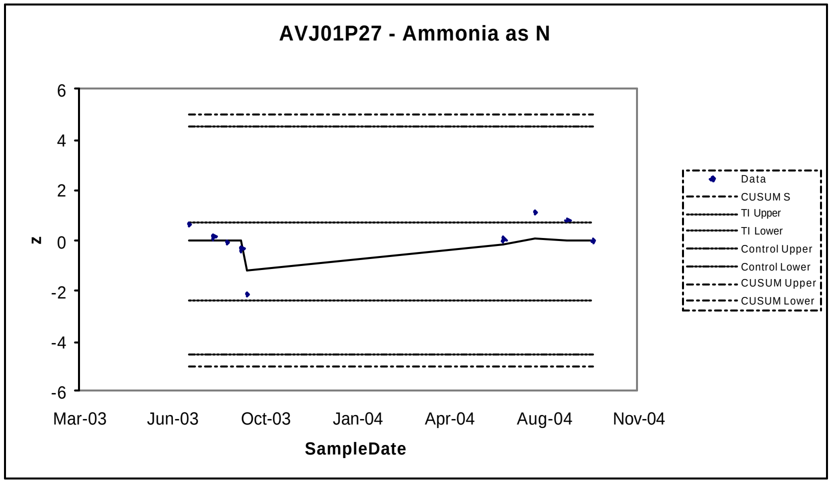
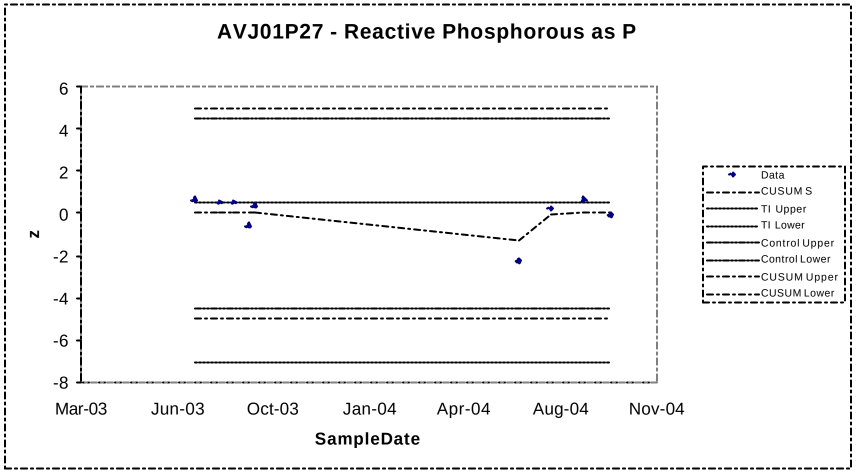
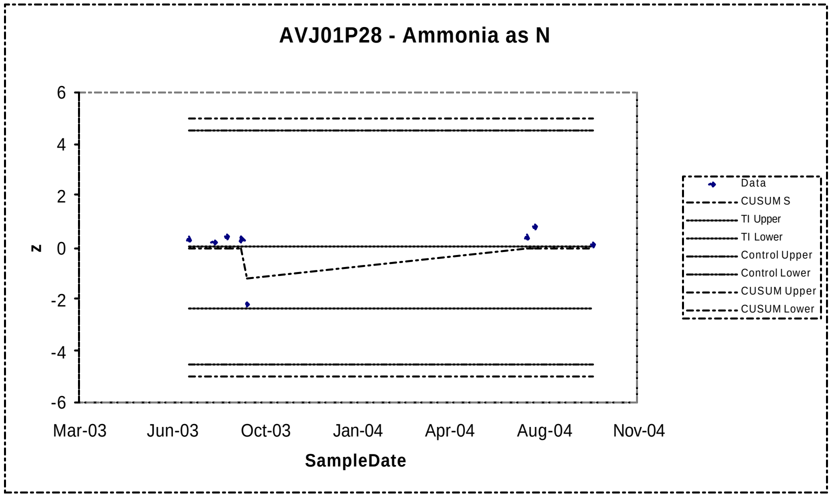


Figure C-11.8.a. Targeted dry weather sites where parameter values were outside the tolerance interval on consecutive sampling events. TI: tolerance interval, Control: Shewart control chart bound, CUSUM: CUSUM control chart bound







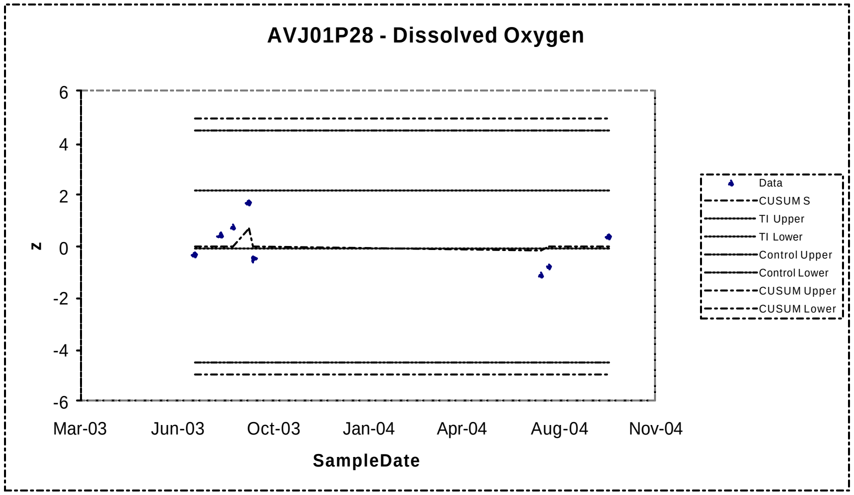
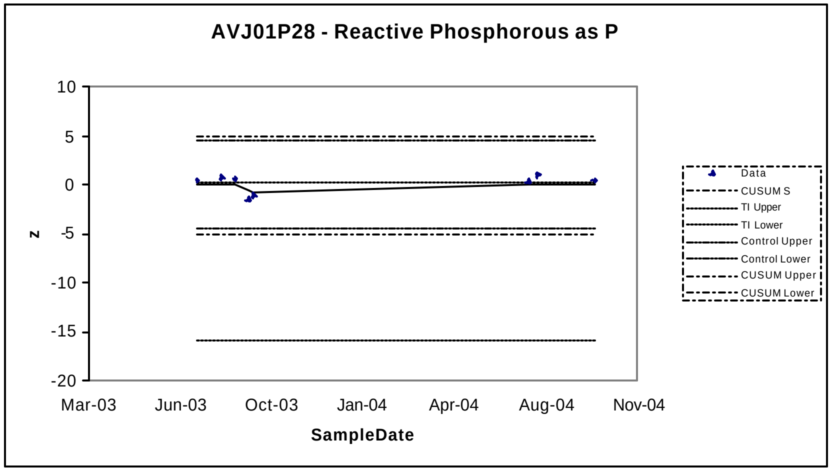
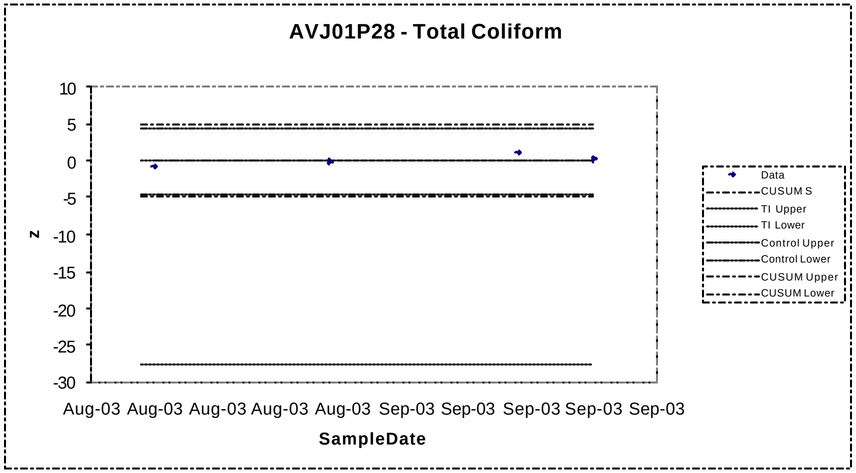
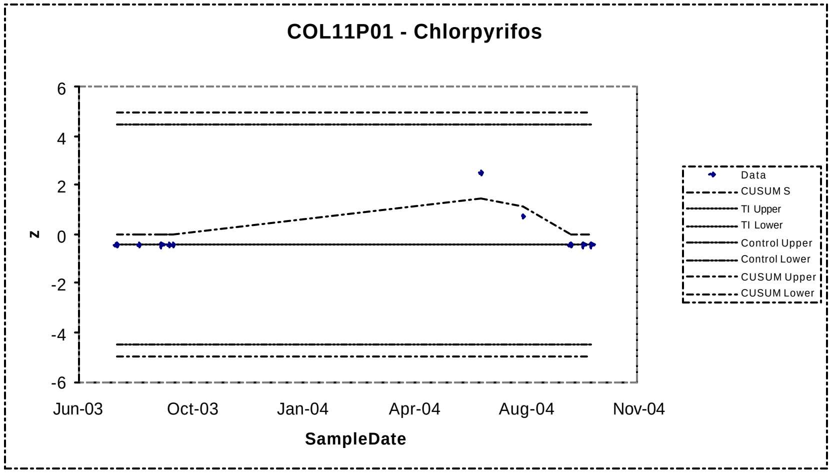


Figure C-11.8.b. Targeted dry weather sites where parameter values were outside the tolerance interval on consecutive sampling events. TI: tolerance interval, Control: Shewart control chart bound, CUSUM: CUSUM control chart bound







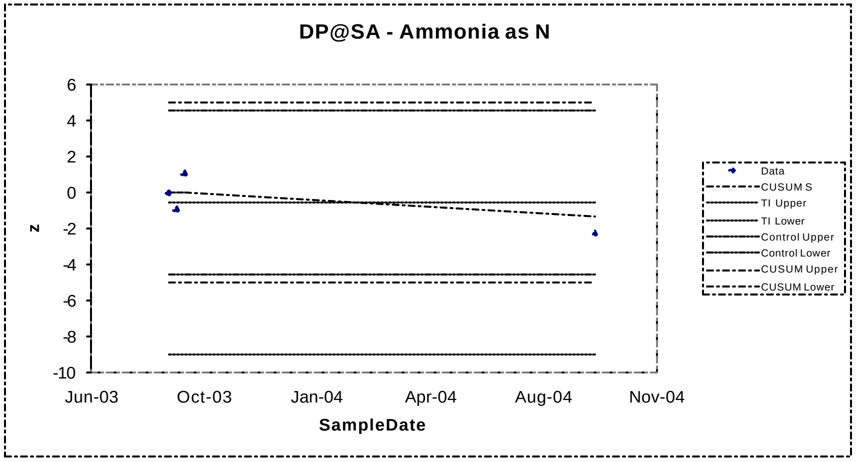
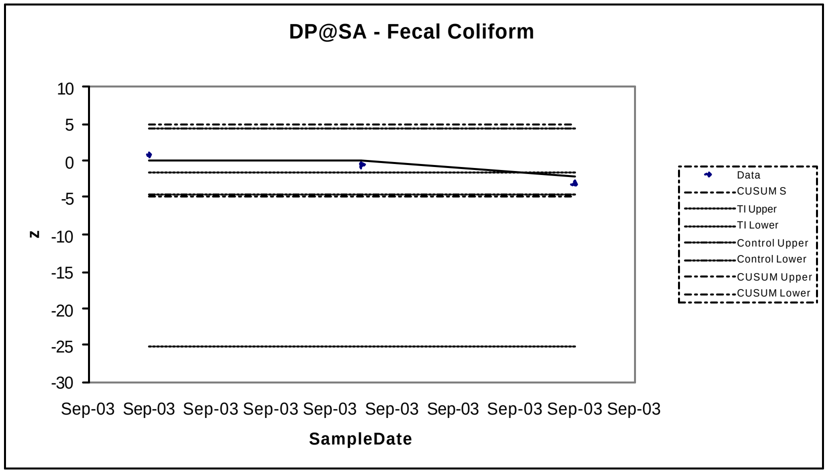
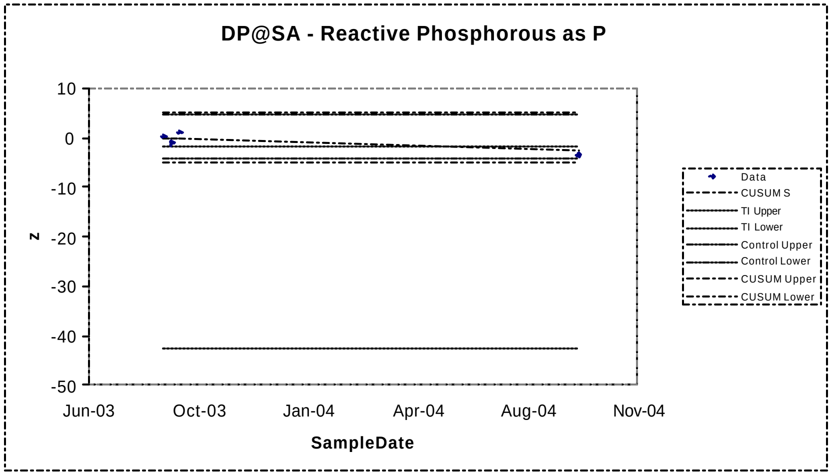
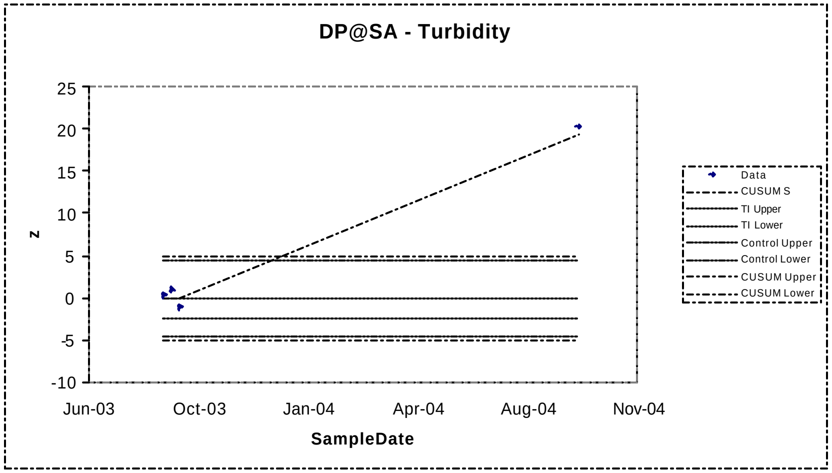


Figure C-11.8.c. Targeted dry weather sites where parameter values were outside the tolerance interval on consecutive sampling events. TI: tolerance interval, Control: Shewart control chart bound, CUSUM: CUSUM control chart bound







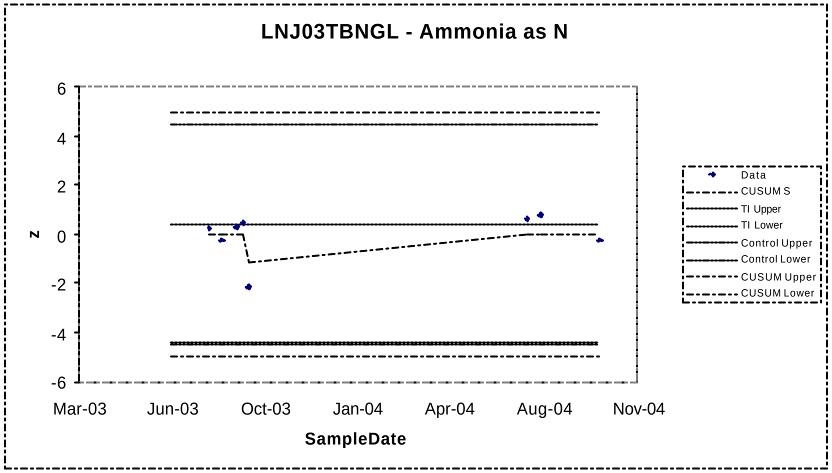
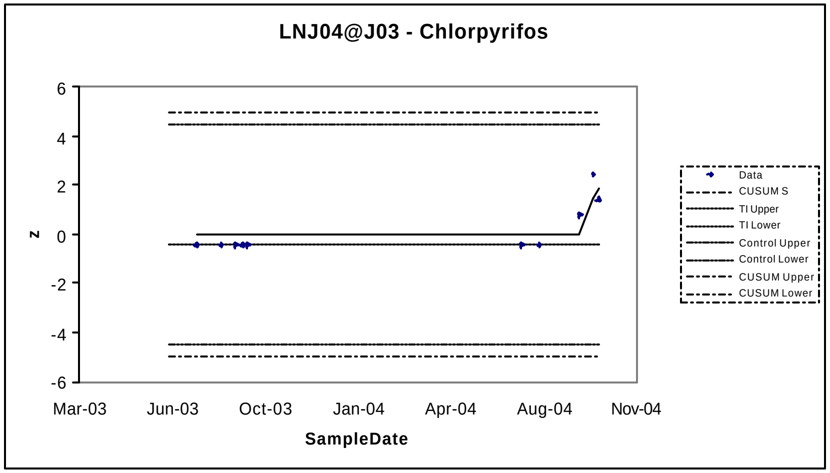
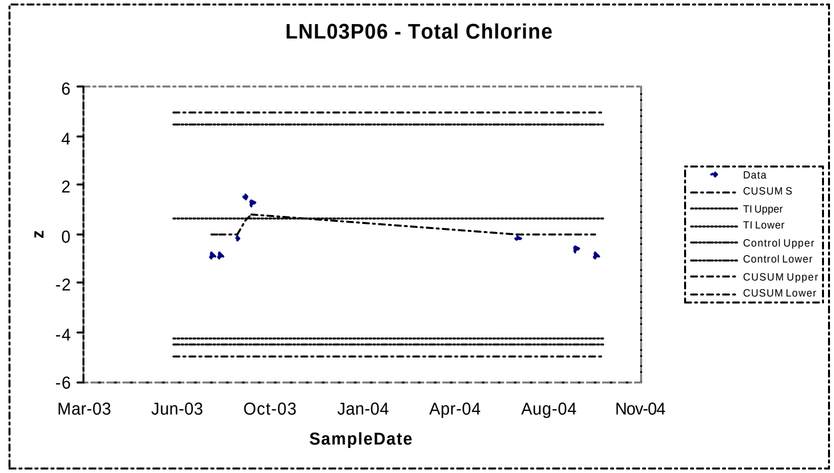
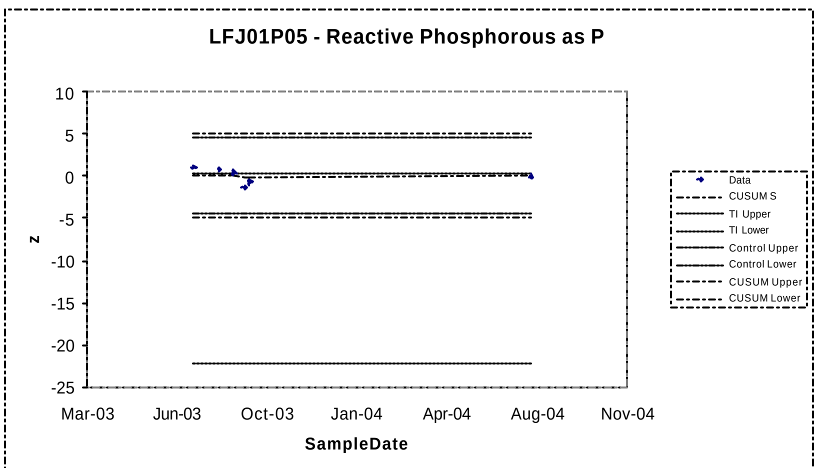


Figure C-11.8.d. Targeted dry weather sites where parameter values were outside the tolerance interval on consecutive sampling events. TI: tolerance interval, Control: Shewart control chart bound, CUSUM: CUSUM control chart bound







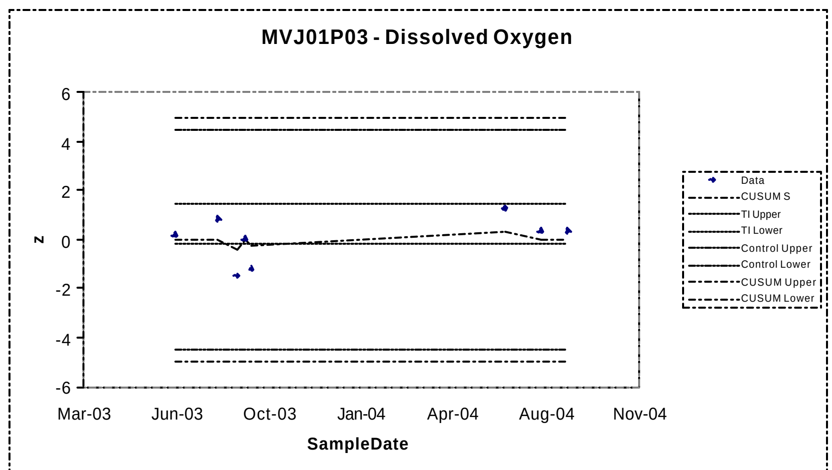
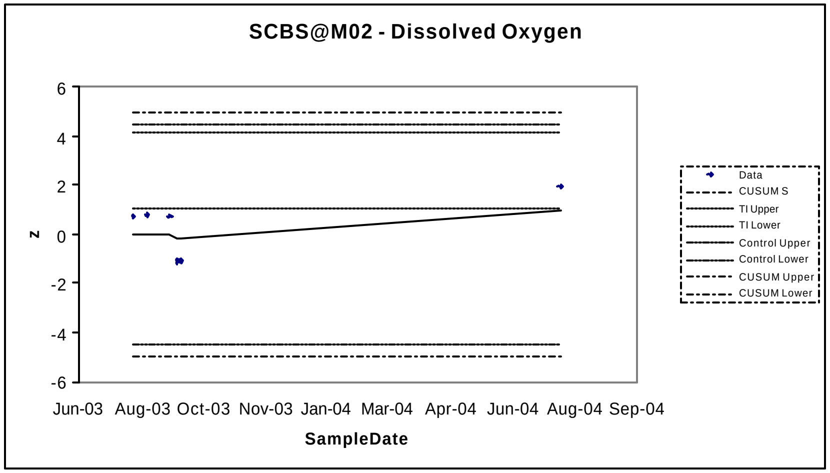
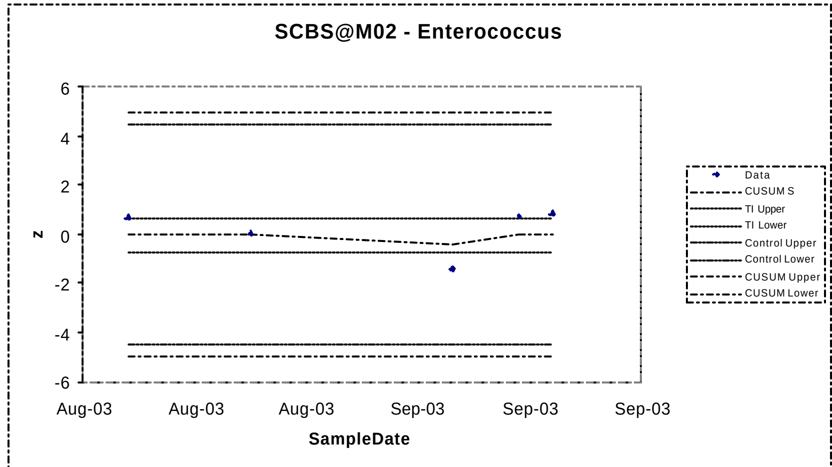


Figure C-11.8.e. Targeted dry weather sites where parameter values were outside the tolerance interval on consecutive sampling events. TI: tolerance interval, Control: Shewart control chart bound, CUSUM: CUSUM control chart bound





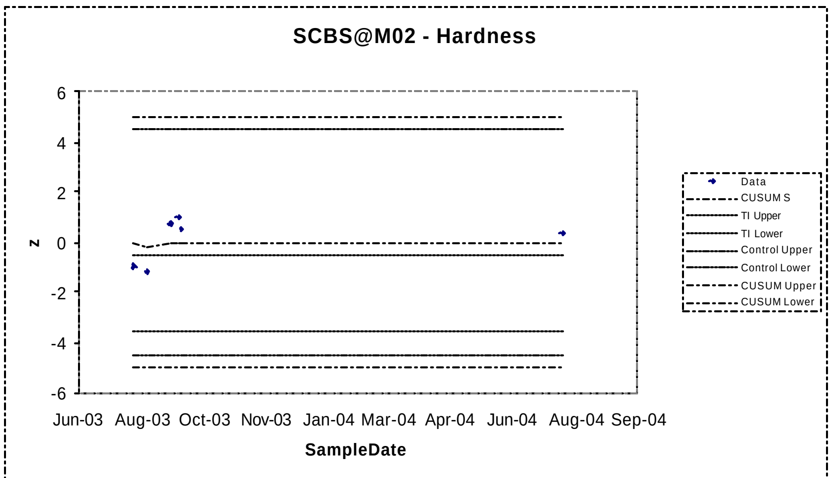
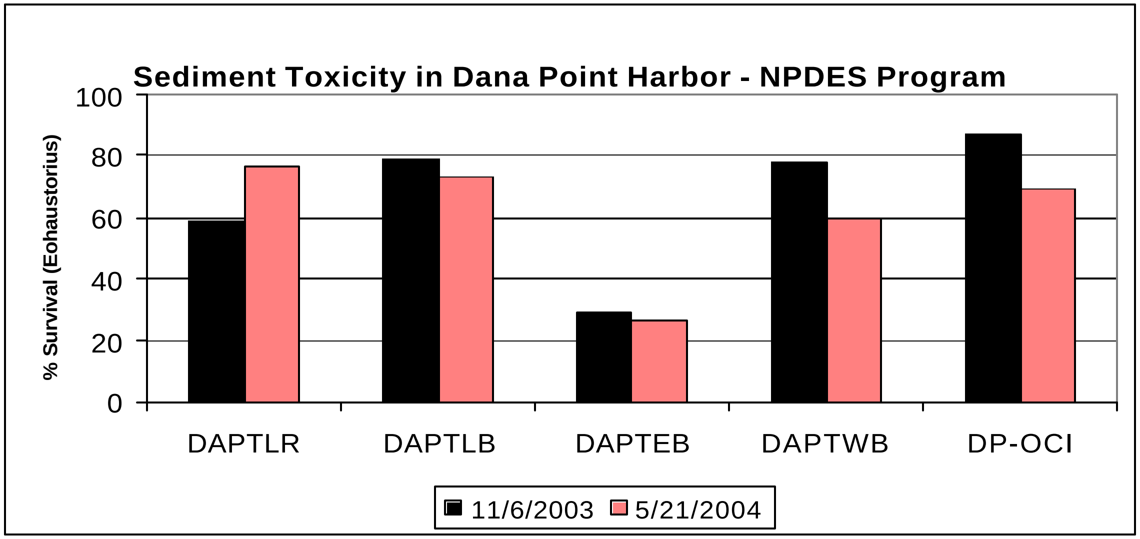


Figure C-11.9. Sediment Toxicity Results From Dana Point Harbor and in Context of Regional Toxicity



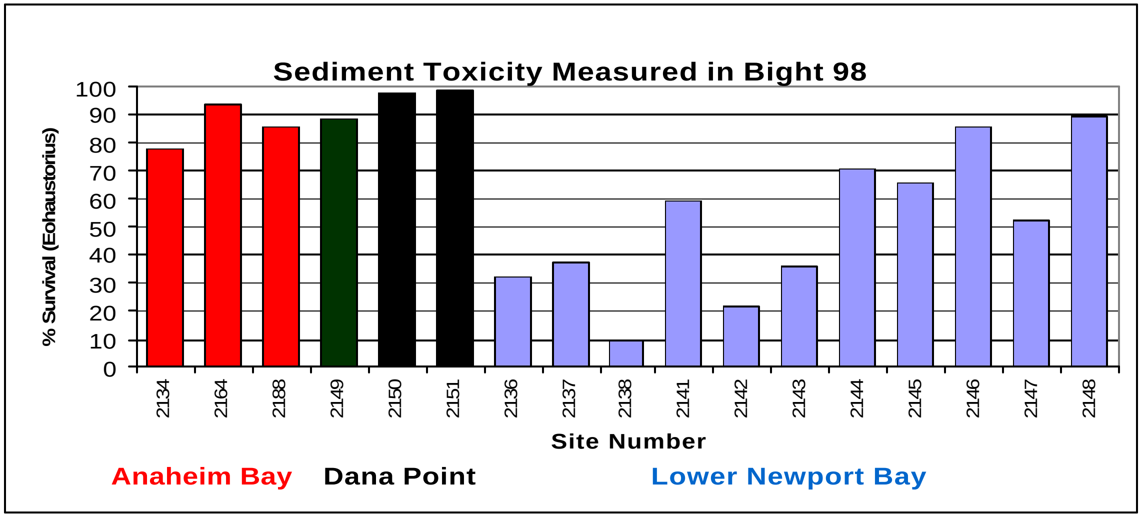
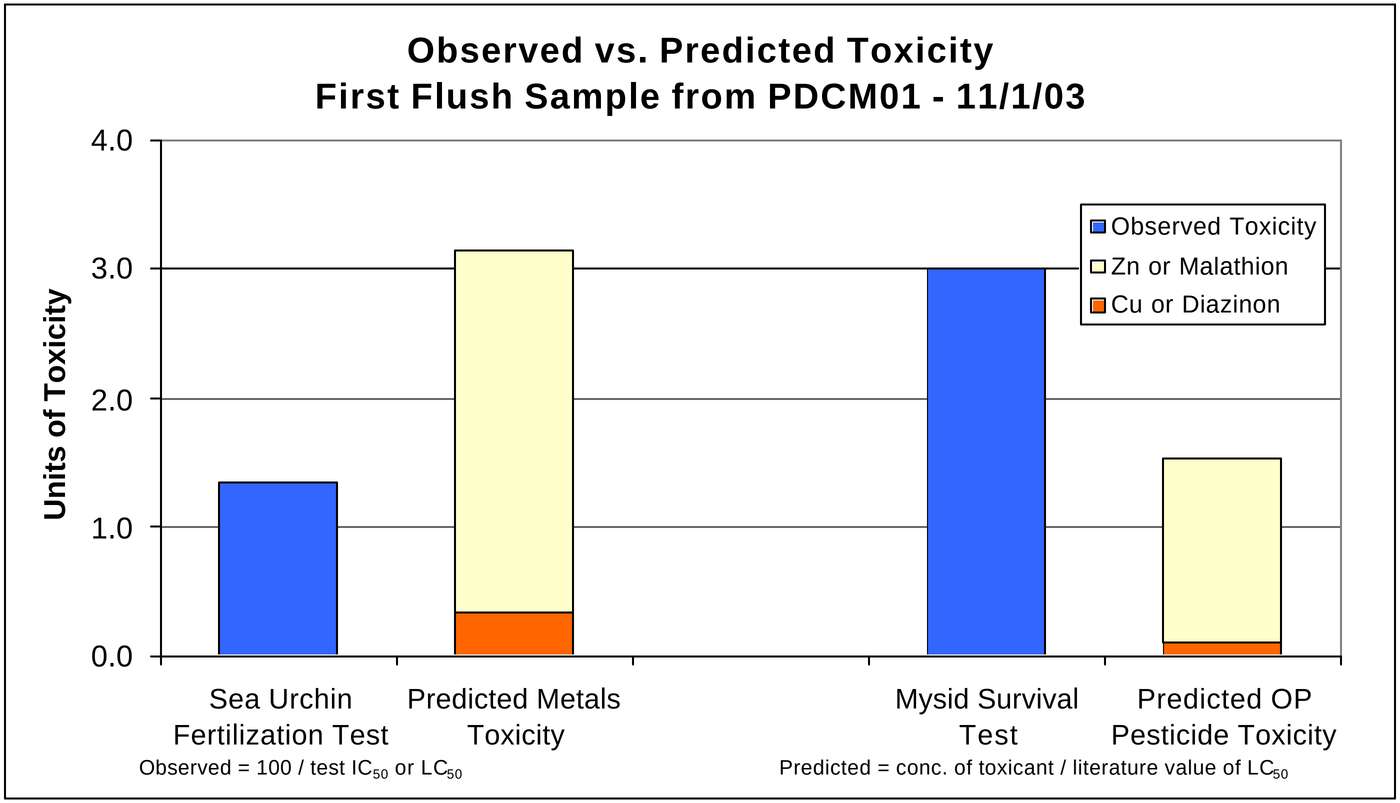


Figure C-11.10. Comparison Between Observed and Estimated Toxicity



Attachment C-11-I

Standard Operating Procedure for Toxicity Tests

STANDARD OPERATING PROCEDURES FOR CHRONIC MYSID SHRIMP (*Mysidopsis bahia*) TOXICITY TEST

ENDPOINT DESCRIPTION

Seven-day-old mysid shrimps (<u>*Mysidopsis*</u> <u>*bahia*</u>) are exposed in a static renewal systems to various test solutions for seven days. The endpoints are survival, growth, and egg development.

DILUTION WATER

Uncontaminated local (collected near Anacapa Island) natural seawater adjusted to 20-30 $\pm$ 2 ppt salinity is used for holding, control, and dilution waters. Water is collected in new five-gallon cubitainers prior to testing and stored at 15 degrees C for up to 24 hours. For longer holding times, water must be stored at 4 degrees C, and at no time should water be stored for any longer than 96 hours.

EFFLUENT CONCENTRATIONS

Test solutions are prepared on the day of initiation and every 24 hours for seven days. Five concentrations, a reference control, and a brine control (each with eight replicate test chambers) are used.

Test chambers are 8-oz plastic disposable cups containing 150 ml of test solution. Mysids are contained within 200-micron Nytex screens cemented around a petri dish with silicone sealant. Each cylinder fits inside the beaker, the liquid is poured in and the mysids are added. All beakers are labeled prior to preparation.

Glassware cleaning Procedure:

1. Wash in warm, soapy water.
2. Rinse with tap water.
3. Rinse with reagent grade acetone.
4. Rinse with D.I. water.
5. Soak in 3N HCL for 24 hours.
6. Rinse with D.I. water.
7. Rinse with 2N HNO3.
8. Rinse with D.I. water.
9. Soak in D.I. water for 24 hours.
10. Rinse with D.I. water.
11. Air dry.

All glassware is rinsed with reference seawater prior to mixing concentrations.

A 1-l glass volumetric flask, various sizes of volumetric pipettes, and a 250-ml graduated cylinder are used to prepare solutions. A total volume of 1600 ml is needed for each concentration; eight replicates and one 400-ml sample for measuring chemical parameters. Effluent concentrations are set according to client requirements.

Hypersaline brine is used to adjust salinity. Six to eight liters of reference seawater are frozen 48 hours before the test. After 24 hours, the water is allowed to partially thaw for about one hour and the liquid is combined into a 1-liter container. If the salinity is not between 60 and 80 ppt, the container is frozen again for 24 hours. After an hour of thawing, the water is separated from the ice. The salinity is then usually between 60 and 80 ppt.

The amount of brine to add to each effluent concentration to obtain a final salinity of 20 $\pm$ 2 ppt is calculated using the following formula:

$$V_B = V_E \frac{(20 - S_E)}{(S_B - 20)}$$

V_B=Volume of Brine to add
V_E=Volume of Effluent
S_E=Salinity of Effluent
S_B=Salinity of Brine

Brine controls are used in all tests when salinity adjustment is necessary. The brine controls contain the same amount of brine added to the highest effluent concentration plus deionized (D.I.) water equal to the amount of effluent added and filled to the 1-l mark with reference seawater. The pH of all brine mixtures are checked and adjusted to within 0.1 units of the dilution water by dropwise addition of dilute HCl or NaOH.

Effluents with salinity greater than 10 ppt, or tests with effluent concentrations greater than 10% use the following formula to calculate the amount of D.I. to add:

$$V_B = V_E \frac{(20)}{(S_B - 20)}$$

The amount of D.I. to add is calculated by solving for V_E.

Effluent concentrations are prepared by combining effluent, hypersaline brine and dilution water using the appropriate dilution factors, volumetric pipets and flasks. Concentrations are mixed from the lowest to the highest to avoid any possible contamination.

STANDARD TOXICANT CONCENTRATIONS

Stock solutions of copper chloride are prepared by Environmental Resource Associates in Arvada, Colorado. The 10,000-ug/l stock is traceable to NBS standards and is guaranteed stable for up to one year. Stocks are replaced after one year or sooner if necessary. A reference test is performed concurrently with each effluent test conducted. A sample of stock solution is analyzed for verification of the copper concentration by a local, certified laboratory at the time of the test to ensure there is no contamination. Solutions consist of one replicate each of 10, 18, 32, 56 and 100 µg/l copper. Solutions are renewed three times throughout the test.

SHIPPING OF TEST ORGANISMS

One to three-day-old mysids are shipped from Brezina and Associates in northern California and arrive the following day. Animals are held in cleaned 20-liter glass aquaria at a density of no more than 20 mysids per liter. Animals are slowly acclimated to test conditions during the holding period. Mysids are fed twice per day and the water is changed every other day.

CHEMICAL PARAMETERS

Dissolved oxygen is measured at the beginning and end of each 24-hour exposure in one test chamber at all test concentrations and in the control. Temperature, pH, and salinity are measured at the end of each 24-hour exposure period in one test chamber at all test concentrations and in the control. pH is measured in the effluent samples daily.

INITIATION OF THE TEST

After concentrations are prepared and chemical measurements are recorded, 5 animals are carefully transferred into each Nytex cylinder using a disposable transfer pipet. After transfer, mysids are fed <24 hour old Artemia nauplii.

INCUBATION

Mysids in test containers are placed under low light (50 to 100 footcandles) at 26-27 deg C with a photoperiod of 16 hours light and 8 hours dark. Test salinity is 20-30 $\pm$ 2 ppt.
Thermographs continuously record temperatures through-out the testing period. Containers are covered with plastic wrap to prevent evaporation during the test. Aeration is only necessary when the D.O. falls below 60%.

TEST SOLUTION RENEWAL

Test solutions are renewed daily and prepared in clean 1000-ml beakers. Each Nytex cylinder is carefully lifted from the old solution and transferred into the new solution taking care not to disturb the mysids. The effluent which has been stored in the refrigerator is warmed to 26 deg C before mixing solutions.

Before transferring mysids, the bottom of each petri dish is cleaned of all debris by siphoning with a transfer pipet. Numbers of live animals are recorded and all dead animals are removed. The mysids are fed enough <24 hour old Artemia nauplii twice per day to ensure that some Artemia remain alive overnight. The Artemia are rinsed with filtered seawater prior to being added to test chambers.

New food suitability is determined in a side-by-side test using four replicates. One treatment is fed the new food and the other is fed food known to be suitable.

TERMINATION OF TEST

After 7 days, the test is terminated. Most of the test solution is poured off and replaced with clean water. The number of surviving immatures, males, females with eggs, and females without eggs is recorded. The larvae are rinsed in D.I. water and placed in clean, tared aluminum weigh boats and dried at 105 deg C for 6 hours. Immediately after removal from the oven, boats are placed in a desiccator overnight to completely cool before weighing. All weights are measured to the nearest 0.01 mg. The average dry weight is determined for each replicate.

ANALYSIS

The *Toxcalc* program is used to interpret data. The pro-portion of surviving animals is determined in each container and the data is arcsine, square root transformed. ANOVA is used to compare concentrations and Dunnett's Test compares concentrations to the control which determines the NOEC. The average dry weight number of females with eggs are determined for each replicate and tested for homogeneity within replicates. Dunnett's Test is used to compare concentrations with the control which determines the NOEC.

TEST ACCEPTABILITY

7-day Mysid Survival/Growth Test

1. Control survival must be greater than 80%.

2. Average dry weight must be greater than 0.20 mg/mysid in the controls.

3. Control fecundity should also be used if egg production by 50% of females is achieved.

REFERENCES

USEPA. 1991. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. EPA-600/4-91/003.

USEPA. 1988. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. EPA-600/4-87/028.

Revised 8/25/03

STANDARD OPERATING PROCEDURES FOR Ceriodaphnia SURVIVAL AND REPRODUCTION TOXICITY TEST

ENDPOINT DESCRIPTION

Less than 24-hour old Ceriodaphnia are exposed to different concentrations in a static renewal system until 60% of the surviving organisms have three broods of offspring. Control organisms usually produce three broods during a seven-day period. The endpoints are survival and reproduction.

DILUTION WATER AND CULTURE MEDIA

Control and dilution water used for this test is moderately hard reconstituted fresh water.

EFFLUENT CONCENTRATIONS

Test solutions are prepared at test initiation and every 24 hours for seven days. Five concentrations and a control, each with ten replicate test chambers, are used. 30-m1 disposable plastic cups are used as testing chambers. The cups are not washed prior to use but glassware used to make effluent dilutions are cleaned by the following method:

1. Wash in warm, soapy water, rinse with tap water.
2. Rinse with reagent grade acetone, rinse with D.I. water.
3. Soak in 3N HCL for 24 hours, rinse with D.I. water.
4. Rinse with 2N HNO3, rinse with D.I. water.
5. Soak in D.I. water for 24 hours.
6. Rinse with D.I. water.
7. Air dry.

Effluent samples typically arrive on ice and must be warmed on a hot plate until temperatures reach 25 deg C. Various sizes of graduated cylinders are used to prepare solutions. A total volume of 500 m1 is needed for each concentration: ten replicates and one 250-m1 sample for measuring chemical parameters. Effluent concentrations are typically set at 100%, 56%, 32%, 18%, and 10%, but if higher toxicity is suspected, concentrations are set at lower ranges provided there is a 56% difference between dilutions.

STANDARD TOXICANT CONCENTRATIONS

A reference toxicant test is run in conjunction with each effluent test conducted. Copper chloride is used as the standard. Ten replicates of six concentrations are prepared at 0, 1, 3, 5, 10, and 20 ppb. One gallon of each concentration is prepared at the beginning of the test and renewals are made daily.

TEST ORGANISMS

A culture brood stock of Ceriodaphnia is kept on an ongoing basis to ensure adequate supply of neonates. The brood board consists of sixty cups, each containing 15 m1 of culture media. One neonate is placed in each cup in the board initiation day and its survival and young are monitored for a period of two weeks. The organisms are fed daily and are transferred to a fresh medium three times weekly. On transfer days, the adult is transferred to fresh medium and the young are counted and discarded (or used in a test). After two weeks, a new board is started using neonates from adults which produce at least eight young in their third brood. Cultures usually produce at least 15 young per adult in three broods (7 days or less). A mass culture is also maintained in case a population crash occurs in the brood board. Neonates from this culture are used only to start a new brood board and are not directly used for the test. Mass cultures are fed daily and transferred to fresh media weekly. The population is culled periodically to about 50 individuals.

FOOD PREPARATION

Ceriodaphnia are fed a combination of yeast, cerophyll, "Tetramin" brand fish food, and green algae (Selenastrum). The yeast, cerophyll, and Tetramin mixture is prepared in the following manner. One week prior to making food, 5.0 grams of Tetramin is added to one liter of deionized water and mixed in a blender. The slurry is poured into an Imhoff cone, covered and aerated for seven days at ambient laboratory temperatures. Any water lost during this digestion procedure is replaced. At the end of the digestion period, the mixture is poured into a flask and allowed to settle for one hour. The supernatant is then filtered through a nytex 100 mesh screen into another 1-liter beaker. The filtered supernatant is combined with the cerophyll and yeast. Fresh; dry "Fleischmans" brand yeast (5.0 grams) is dissolved into one liter of deionized water on a stir plate. The suspension is not allowed to settle and is immediately combined with equal parts of cerophyll and Tetramin. Excess suspension is discarded. 5.0 grams of cerophyll is placed in a blender with one liter of deionized water and mixed for five minutes. This mixture is filtered through a 110 mesh nytex screen. Equal portions of the three types of prepared food are mixed, and aliquots are poured into 125-m1 plastic beakers and frozen until needed. Thawed food is kept in the refrigerator for up to two weeks and fed to the Ceriodaphnia daily. Following food preparation and before aliquots are poured, a suspended solids analysis is performed and the mixture is either concentrated of diluted to obtain a result of 1800 mg/l. The suspended solids are monitored in the following manner:

1. Two pans are oven dried and weighed.
2. The combined YCTF is shaken to get a uniform sample.
3. 5.0 ml are dispensed in each of the two pans.
4. Pans are dried for at least four hours then allowed to cool in the desiccator.
5. Pans are weighed again.
6. The weights are converted to mg/l by:

$$\text{Difference in wt. of pans X } \frac{1000}{0.005}$$

7. The dilution factor is obtained by: $\frac{\text{mg/l TSS}}{\text{1800 mg/l}}$

this result is multiplied by volume of YCTF to set the final volume after dilution.

8. If a large dilution factor was used, this is repeated after dilution to confirm TSS.
9. The acceptable solids level is between 1700 and 1900 mg/l.

Algae is prepared from an ongoing stock culture maintained in the laboratory. The algae used for the Selenastrum toxicity test is inoculated into fresh media weekly. The remainder of algae is placed in the refrigerator, allowed to settle, and then concentrated. When algae is needed for feeding, a portion of the concentrate is diluted to 3.0 to 3.5 x 10 (7) cells/mi. The density is obtained by hemacytometer counts. Once the final cell density is obtained, the bottle is labeled and recorded in a log book. This concentrate is used for one month. The suitability of each new food supply is determined in a side-by-side test using two treatments with four replicates per treatment. One treatment is fed the new food and the other is fed food already known to be suitable.

FEEDING

Cultures are fed daily. 0.1 m1 YCTF and 0.1 mi algae are delivered to each cup.

INITIATION OF THE TEST

After effluent concentrations are prepared, the chemical measurements are recorded: dissolved oxygen, pH and conductivity are measured at the beginning and end of each 24-hour exposure period in each test concentration and the control. Alkalinity and hardness are measured in the highest concentration and the control at the beginning of the test. Thermographs continuously record temperatures (25 $\pm$ 1 deg C), and a photoperiod of 16 hours light and 8 hours dark is maintained throughout the testing period. Neonates which are less than 24 hours old and within, 8 hours of the same age are selected from individual brood boards. Ten board animals with 8 or more young are selected for setting up the test. The ten brood cups are placed in a row. Each concentration of effluent has ten cups. One neonate from the same female is placed in each concentration of effluent. This blocking procedure allows the performance of each female to be tracked. If the female produces one weak offspring or male, the likelihood of producing all weak offspring or males is greater. By using this technique, poor performance of young from a given female can be omitted from all concentrations (See USEPA 1989.)

TEST SOLUTION RENEWAL

Test solutions are renewed daily and prepared in clean 500-m1 beakers. A minimum of three effluent samples are received from the client for use on days 1, 3 and 5. Samples are stored at 4 deg C. The test organisms are transferred to fresh solutions using disposable transfer pipets. Care is taken to release the animals beneath the surface of the water so that no air is trapped under the carapace. The number of live young and the adult mortality is reported. The young are discarded after recording.

TERMINATION OF THE TEST

Tests are finished when at least 60% of surviving control females have produced a third brood (usually seven days).

ANALYSIS

Toxcalc, a computer program is used to analyze data. The flow charts for statistical analysis of survival and growth as described in the EPA manual are followed to obtain NOEC estimates.

TEST ACCEPTABILITY

1. Control survival must be greater than 80%.
2. Reproduction in controls must average 15 or more young per surviving female.

REFERENCE

USEPA. 1991. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh-water Organisms*. EP A-600/4-91/002.

USEPA. 1989. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh-water Organisms*. EP A-600/4-89/001.

Revised: 8/25/03

STANDARD OPERATING PROCEDURES FOR THE CHRONIC FATHEAD MINNOW LARVAE TOXICITY TEST

ENDPOINT DESCRIPTION

Twenty-four hour old fathead minnow larvae (*Pimephales promelas*) are exposed in a static renewal system to various test solutions for seven days. The endpoints are survival and growth (increase in weight) of the larvae compared to the controls.

DILUTION WATER

Dilution and control water used for this test is moderately hard, reconstituted fresh water.

EFFLUENT CONCENTRATIONS

Test solutions are prepared at test initiation and every 24 hours for seven days. Five concentrations and a control, each with four replicate test chambers, are used. The chambers are 250-ml borosilicate glass crystallizing dishes. The larvae are contained within 200-micron Nytex screens cemented around a petri dish with silicone sealant. Each cylinder fits inside the dish, the liquid is poured in and the fish are added. All dishes are labeled. Glassware cleaning procedure:

1. Wash in warm, soapy water, rinse with tap water.
2. Rinse with reagent grade acetone, rinse with D.I. water.
3. Soak in 3N HCL for 24 hours, rinse with D.I. water.
4. Rinse with 2N HNO3, rinse with D.I. water.
5. Soak in D.I. water for 24 hours.
6. Rinse with D.I. water.
7. Air dry.

Effluent samples arrive on ice and must be placed on a heat plate until temperatures reach 25 deg C before set-up. Various sizes of graduated cylinders are used to prepare solutions. A total volume of 1,250 ml is needed for each concentration: four replicates and one 250-ml sample for measuring chemical parameters. Effluent concentrations are typically set at 100%, 56%, 32%, 18% and 10% but if higher toxicity is suspected, concentrations may be at lower ranges as long as the 56% difference between dilutions is maintained.

STANDARD TOXICANT CONCENTRATIONS

A reference toxicant test is run in conjunction with each effluent test conducted. Copper chloride is used as the standard. Four replicates of six concentrations are prepared at 0, 38, 75, 100, 150, and 300 ppb. One gallon of each concentration is prepared at the beginning of the test and renewals are made daily.

SHIPPING OF TEST ORGANISMS

Newly hatched larvae are shipped from Aquatox in Hot Springs, Arkansas and arrive at Aquatic Bioassay the following day. The conditions of the organisms are checked, and the tests begin the day of arrival to ensure that 24-hour old larvae are used.

CHEMICAL PARAMETERS

Aeration is used only when dissolved oxygen (D.O.) concentrations fall below 40% saturation. If this becomes necessary, chambers are aerated at a rate not to exceed 100 bubbles per minute. At the beginning of the test and every 24 hours thereafter, the following measurements are recorded: temperature, pH, and conductivity. Dissolved oxygen is measured at the beginning and end of each 24 hour exposure period in one test chamber at all test concentrations and the control. Hardness and alkalinity measurements are made daily on the control and highest concentration as well.

INITIATION OF THE TEST

After concentrations are prepared and chemical measurements are recorded, 10 animals are carefully transferred into each Nytex cylinder using disposable transfer pipets. Containers are randomly placed on racks in a temperature controlled room at 25 $\pm$ 1 deg C with a photoperiod of 16 hours light and 8 hours dark. Thermographs continuously record temperatures during the testing period.

FEEDING

The fish in each chamber are fed approximately 700-1000 newly hatched (<24 hours old) brine shrimp twice daily, once in the morning and then after renewal of the test solutions. The larvae are not fed on the last day of the test. All brine shrimp nauplii are rinsed with D.I. water and concentrated before use. The amount of food provided is sufficient to ensure the presence of a small amount of uneaten food at the next feeding. The suitability of each new food supply is determined in a side-by-side test using two treatments with four replicates per treatment. One treatment is fed the new food and the other is fed food already known to be suitable.

TEST SOLUTION RENEWAL

Test solutions are renewed daily and prepared in clean 1000-ml beakers. Each Nytex cylinder is carefully lifted from the old solution and transferred into the new solution, taking care not to disturb the larvae. The effluent which has been stored in the refrigerator is warmed to 25 deg C before mixing solutions. Before transferring larvae, the bottom of each petri dish is cleaned of all debris by siphoning with a transfer pipet. Numbers of live larvae is recorded and all dead animals are removed.

TERMINATION OF TEST

After the 7-day exposure period, the test is terminated. The number of surviving larvae are recorded and then transferred into labeled vials containing 70% ethanol for subsequent weight determination. Immediately before drying, the larvae are rinsed in D.I. water. They are then individually placed in clean, tared aluminum weigh boats and dried at 100 deg C for a minimum of 6 hours. Immediately after removal from the oven, boats are placed in a desiccator overnight to completely cool before weighing. All individual weights are measured to the nearest 0.01 mg. For each test chamber, the final dry weight is divided by the original number of larvae to determine average individual dry weight. In addition, the control final dry weight is divided by the number of surviving fish to determine if the weight acceptability criteria has been met.

ANALYSIS

The Toxcalc computer program is used to analyze data. The flowcharts for statistical analysis of survival and growth as described in the EPA manual are followed to obtain NOEC estimates.

TEST ACCEPTABILITY

1. Control survival must be greater than 80%.
2. Average dry weight must be greater than 0.25 mg.

REFERENCE

USEPA. 1991. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh-water Organisms*. EPA-600/4-91/002.

USEPA. 1989. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh-water Organisms*. EPA-600/4-89/001.

Revised: 8/25/03

STANDARD OPERATING PROCEDURES FOR *Selenastrum capricomutum* TOXICITY TEST

ENDPOINT DESCRIPTION

Selenastrum are exposed to various effluent concentrations for 96 hours. The endpoint is change in cell density.

DILUTION WATER

Stock solutions are prepared by combining reagent grade chemicals with deionized water, mixing, and storing at 4 deg C in the dark for at least one month before use. Culture medium is prepared by adding 1 m1 of each stock solution (except Na_2SiO_3) in a one-liter volumetric flask and bringing to volume with deionized water. The medium is autoclaved and Na_2SiO_3 is added once it has cooled. The pH is adjusted to 7.5 by adding 0.1 N NaOH or HCl. Culture media are stored at room temperature until used.

ALGAL CULTURES

Stock cultures are initiated weekly by transferring 1 ml of seven to ten-day-old algae to a 500-m1 culture flask containing a fresh medium. Stocks are examined microscopically for contaminating microorganisms at each transfer.

SAMPLE PREPARATION

Effluent samples are filtered through a 0.45-micron filter to remove contaminating organisms which may be present in the effluent. One ml of each stock solution (except EDT A) is added to one liter of effluent to eliminate false negative results caused by low nutrient effluents. By doing this, all test treatments will contain, as a minimum, the concentration of nutrients in the controls.

EFFLUENT CONCENTRATION

Test chambers used are 125-ml Erlenmeyer flasks. Five concentrations and a control, each with three replicates, are prepared. Chambers and glassware are dry-air sterilized before concentrations are mixed. Glassware cleaning procedure:

1. Wash in warm, soapy water, rinse with tap water.
2. Rinse with reagent grade acetone, rinse with D.I. water.
3. Soak in 3N HCL for 24 hours, rinse with D.I. water.
4. Rinse with 2N HNO3, rinse with D.I. water.
5. Soak in D.I. water for 24 hours.
6. Rinse with D.I. water.
7. Air dry.

Effluent samples usually arrive on ice and must be placed in a water bath until temperatures reach 25 deg C. Various sizes of graduated cylinders are used to prepare solutions. A total volume of 500 m1 is needed for each concentration: three replicates and one 125-m1 sample for measuring chemical parameters. Effluent concentrations are typically set at 100%, 56%, 32%, 18%, and 10%, but if higher toxicity is suspected, concentrations may be set at lower ranges provided there is a 56% difference between dilutions.

STANDARD TOXICANT CONCENTRATIONS

A reference toxicant test is run in conjunction with effluent test. Zinc chloride is used as the standard. Three replicates of five concentrations are prepared at 0, 100, 180,320, and 560 ppb.

CHEMICAL PARAMETERS

No aeration is required in the algae test. At the beginning of the test the following measurements are recorded in the high, medium, and low test concentrations and the control: dissolved oxygen, temperature, pH, hardness, alkalinity and residual chlorine. Calibrated thermographs record temperatures continuously throughout the test.

INITIATION OF THE TEST

The algal inoculum is prepared no more than 2-3 hours before test initiation. *Selenastrum* from a 4 to 7 day stock culture is used. 10,000 cells per ml ($\pm$10%) is required. Cell density is checked in the final inoculum and in three of the test solutions within two hours of inoculation. The volume of stock culture required is obtained by:

$$\text{vol.} = \frac{\text{no. flasks x test vol per flask x 10,000 cells/ml}}{\text{cell density (cells/ml) in stock culture}}$$

This concentrate is diluted to obtain a final density of 1,250,000 cells/ml. The test begins when algae is added to the flasks. The 1,250,000 cell/ml inoculum is mixed well and 1 ml is added to each test solution.

INCUBATION

Test flasks are incubated under continuous cool white fluorescent lighting (400 $\pm$ 40 ft-c) at 25 $\pm$ 1 deg C and shaken twice daily by hand. The flasks are randomly rotated daily to minimize possible spatial differences in illumination and temperature.

TERMINATION OF THE TEST

After 96 hours, the test is terminated. The algal growth is measured by Coulter Counter calibrated against the hemacytometer. Three replicate counts are made for each flask. The flask is shaken vigorously and 2 m1 are placed in a vial containing 10 m1 of 1 % saline, stirred and run through the Coulter Counter.

ANALYSIS

Toxcalc, a computer program, is used to analyze data. The flowchart for statistical analysis of growth as described in the EPA manual are followed to obtain NOEC estimates.

TEST ACCEPTABILITY

1. Algal density in the control must exceed 2 x 10 (5) cells/ ml at end of test.

2. Control variability cannot vary more than 20% among replicates.

REFERENCE

USEPA. 1991. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh-water Organisms*. EPA-600/4-91/002.

USEPA. 1989. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. EPA-600/4-89/00 1.

Revised: 8/25/03

STANDARD OPERATING PROCEDURES FOR PURPLE SEA URCHIN AND SAND DOLLAR FERTILIZATION BIOASSAYS (EPA/600/R-95/136)

ENDPOINT DESCRIPTION

Sea urchin (*Strongylocentrotus purpuratus*) or sand dollar (*Dendraster excentricus*) sperm cells are exposed to test solutions for 20 minutes prior to addition of eggs in various effluent concentrations. Fertilized eggs are exposed for another 20 minutes. The endpoint is fertilization success determined by the presence or absence of a membrane.

DILUTION WATER

Sources include: 1) Receiving water: seawater collected from clean areas near the vicinity of the outfall, 2) 0.2 micron, filtered, UV sterilized seawater from Proteus Seafarms in Oxnard, California, or 3) reconstituted seawater using "Tropic Marin" brand sea salts and deionized (D.I.) water. The holding and testing temperature for this test is 12 $\pm$ 1 deg C.

EFFLUENT CONCENTRATIONS

Test solutions are prepared prior to spawning. Five concentrations, a control and a brine control (if salinity adjustment is needed) each with four replicate test chambers are used. Test chambers are 3-ml Falcon brand, well plates with covers. All flasks are rinsed with reference sea water and numbered before solutions are prepared.

Glassware cleaning procedure:

1. Wash in warm, soapy water, rinse with tap water,
2. Rinse with reagent grade acetone, rinse with D.I. water,
3. Soak in 3N HCL for 24 hours, rinse with D.I. water,
4. Rinse with 2N HNO3, rinse with D.I. water,
5. Soak in D.I. water for 24 hours,
6. Rinse with D.I. water,
7. Air dry.

All glassware is rinsed with reference seawater prior to mixing solutions. Beginning with the effluent control, a one-liter glass volumetric flask, various volumetric pipettes, and a 100-ml graduated cylinder are used to prepare solutions. A total volume of 60 ml is needed per dilution; four replicates and one 50-ml sample for measuring chemical parameters. Effluent dilutions are set according to client requirements.

For concentrations above 5.6%, a brine is used to adjust salinity. Six to eight liters of reference seawater are frozen 48 hours before the test. After 24 hours, the water is allowed to partially thaw for about one hour and the liquid is combined into a one-liter container. If the salinity is not between 60 and 80 ppt, the container is frozen again for 24 hours. After an hour of thawing, the water is separated from the ice. The salinity is then usually between 60 and 80 ppt. The amount of brine to add to each effluent concentration to obtain a final salinity of 34 $\pm$ 2 ppt is calculated using the following formula:

$$V_B = V_E \frac{(34 - S_E)}{(S_B - 34)}$$

V_B=Volume of Brine to add

V_E=Volume of Effluent to add

S_E=Salinity of Effluent
S_B=Salinity of Brine

Brine controls are used in all tests when salinity adjustment is necessary. The brine controls contain the same amount of brine added to the highest effluent concentration plus D.I. water equal to the amount of effluent added. The pH of all mixtures are adjusted to within 0.1 units of the dilution water by dropwise addition of dilute HCl or NaOH. For effluents with salinity greater than 10 ppt, or tests with effluent concentrations greater than 10%, the following formula is used to calculate the amount of D.I. to add:

$$V_B = V_E \frac{(34)}{(SB - 34)}$$

The amount of D.I. to add is calculated by solving for V_E.

Effluent concentrations are prepared by combining effluent, hypersaline brine, and dilution water using the appropriate dilution factors. Concentrations are mixed from the lowest to the highest to avoid potential contamination.

REFERENCE TOXICANT CONCENTRATIONS

Stock solutions of copper chloride are prepared by Environmental Resource Associates in Arvada, Colorado. The 10,000 µg/l stock is traceable to NBS standards and is guaranteed stable for up to one year. The stock is discarded after this time. Five replicates and a sample for chemical and physical parameters are prepared by mixing 0.28, 0.5, 0.9, 1.6 and 2.8 ml with reference seawater in a 500 ml volumetric flask. Before each test, a sample of stock solution is sent to a local, certified laboratory for analysis to ensure the stock has not been contaminated.

SPAWNING OF ANIMALS

Urchins or sand dollars are rinsed off in clean seawater, injected with 1 ml of 0.5 M KCl through the peristomal membrane (0.5 ml through oral opening for sand dollars). Females are inverted over beakers to collect the eggs. Sperm is collected without dilution using a micropipette and placed in a small beaker on ice. The beaker should be covered with parafilm. Sperm should be checked for motility using a microscope. Sperm must be used within four hours. Eggs are rinsed into a large beaker and are washed two or three times with clean seawater (with settling allowed between washings).

DETERMINATION OF EGG DENSITY

A sample of eggs from each spawning female is inspected under a microscope, and batches containing immature, small, or misshapen eggs are discarded. The remaining batches of eggs are pooled and combined into a one-liter glass beaker. The eggs are suspended evenly into the solution, and a 1-ml sub-sample is removed and combined with 9 ml of seawater in a 10-ml graduated cylinder. This solution is also thoroughly mixed. A 1-ml sub-sample is again removed and added to a Sedgewick-Rafter slide, and eggs are counted microscopically. Counts should be between 200 and 245 eggs per ml. The stock solution is adjusted as needed to obtain the necessary concentration.

PREPARATION OF SPERM

Sea Urchin Fertilization Test

A 0.025-ml sub-sample of sperm pooled preferably from four males is diluted with 100 ml of seawater and is thoroughly mixed. 9 ml of this solution is combined with 1 ml of acetic acid (to inactivate the sperm) and a 0.1 ml of solution is added to a hemacytometer. Hemacytometer counts should be between 51 and 408 using a five-square counting pattern, and, if not, the stock solution is adjusted.

TRIAL ESTIMATE OF FERTILIZATION

0.03 ml of sperm solution and 0.30 ml of egg suspension are combined with 3 ml of seawater. The embryos are inspected under a microscope, and if fertilization is greater than 80% the test is initiated. If lower, sperm and egg solutions are reprepared. An "egg blank" (with no sperm added) is also inspected in order to ensure that pre-fertilization has not occurred.

FERTILIZATION OF EGGS

The recommended initial sperm to egg ratio for fertilization of the eggs is 500:1. The following equations are used to determine the correct volume of the sperm dilution to add to the egg dilution.

volume of egg dilution X 1,000 eggs/ mL = total # of eggs in dilution

total # of eggs in dilution X 500 sperm/ egg = # sperm needed

# of sperm needed ÷ # sperm/mL in sperm dilution = mL sperm solution

This volume of the sperm dilution is added to the egg dilution and mixed gently with a plunger. After 10 minutes, fertilization is checked. If fertilization is not at least 90%, a second volume of the sperm dilution is added. After 10 minutes, fertilization is rechecked. If the fertilization is still not at least 90%, then the test is restarted with different gametes.

DELIVERY OF FERTILIZED EGGS TO THE TEST CHAMBERS

The fertilized egg mixture is gently mixed. 0.25 mL of the egg solution is delivered to each vial using an automatic pipette with the tip cut off to providing a 0.5mm opening. The embryos are delivered into the test chambers directly from the pipette, taking care not to touch the pipette to the test solution. The egg solution temperature is held within 1° C of the test solutions. The eggs are kept well mixed during the delivery procedure.

INCUBATION

The embryos are incubated for 72 hours in the test chambers at 15 ± 1° C at ambient light level.

TERMINATION OF THE TEST

Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in at least one test chamber at each concentration and in controls.

0.5mL of 1% glutaraldehyde is added to each test chamber, gently mixed and stored for later examination.

COUNTING

Embryos are counted within one week of preservation. Vials are placed on an inverted microscope. The first 100 embryos encountered are counted, examined and recorded.

ENDPOINTS

Normal larvae should have a pyramid shape with a pair of skeletal rods that extend at least half the length of the long axis of the larvae. The gut should be differentiated into three parts. If the gut appears lobed and constricts distally in specimens with an obstructed view, then normal gut development may be inferred. Finally, if development of post-oral arms are observed, the development is determined to be normal. All other embryos are scored as abnormal.

TEST ACCEPTABILITY

1. 80% normal shell development must be observed in controls.
2. The minimum significant difference is <25% relative to the controls.
3. The sperm count for the final sperm stock must not exceed 33,600,000/ml.
4. 90% fertilization of the egg/sperm mixture must be achieved prior to initiation of the test.
5. Dilution water egg blanks and effluent egg blanks should contain essentially no eggs with fertilization membranes.

REFERENCES

US EPA. 1995. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms.* EPA/600/R-95/136.

Chapman, G.A. 1994. *Sea urchin* (Strongylocentrotus purpuratus) *and sand dollar* (Dendraster excentricus) *fertilization test method*. USEPA. Newport, Oregon (draft).

Dinnel, P.J. et.al. 1987. *Improved methodology for sea urchin sperm cell bioassay for marine waters*. Archives of Environmental Contamination and Toxicology. 16:23-32.

Hunt, J., Anderson, B. *Abalone development: Short-Term Toxicity Test Protocol. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project*. State Water Res. Control Board. Sacramento (Current Ed.).

State Water Resources Control Board. 1996. *Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project.* 96-IWQ.

Revised 8/25/03

STANDARD OPERATING PROCEDURES FOR PURPLE SEA URCHIN AND SAND DOLLAR FERTILIZATION BIOASSAYS (EPA/600/R-95/136)

ENDPOINT DESCRIPTION

Sea urchin (*Strongylocentrotus purpuratus*) or sand dollar (*Dendraster excentricus*) sperm cells are exposed to test solutions for 20 minutes prior to addition of eggs in various effluent concentrations. Fertilized eggs are exposed for another 20 minutes. The endpoint is fertilization success determined by the presence or absence of a membrane.

DILUTION WATER

Sources include: 1) Receiving water: seawater collected from clean areas near the vicinity of the outfall, 2) 0.2-micron, filtered, UV sterilized seawater from Proteus Seafarms in Oxnard, California, or 3) reconstituted seawater using "Tropic Marin" brand sea salts and deionized (D.I.) water. The holding and testing temperature for this test is 12 $\pm$ 1 deg C.

EFFLUENT CONCENTRATIONS

Test solutions are prepared prior to spawning. Five concentrations, a control and a brine control (if salinity adjustment is needed) each with four replicate test chambers are used. Test chambers are 3-ml Falcon brand, well plates with covers. All flasks are rinsed with reference sea water and numbered before solutions are prepared.

Glassware cleaning procedure:

1. Wash in warm, soapy water, rinse with tap water,
2. Rinse with reagent grade acetone, rinse with D.I. water,
3. Soak in 3N HCL for 24 hours, rinse with D.I. water,
4. Rinse with 2N HNO3, rinse with D.I. water,
5. Soak in D.I. water for 24 hours,
6. Rinse with D.I. water,
7. Air dry.

All glassware is rinsed with reference seawater prior to mixing solutions. Beginning with the effluent control, a one-liter glass volumetric flask, various volumetric pipettes, and a 100-ml graduated cylinder are used to prepare solutions. A total volume of 60 ml is needed per dilution; four replicates and one 50-ml sample for measuring chemical parameters. Effluent dilutions are set according to client requirements.

For concentrations above 5.6%, a brine is used to adjust salinity. Six to eight liters of reference seawater are frozen 48 hours before the test. After 24 hours, the water is allowed to partially thaw for about one hour and the liquid is combined into a one-liter container. If the salinity is not between 60 and 80 ppt, the container is frozen again for 24 hours. After an hour of thawing, the water is separated from the ice. The salinity is then usually between 60 and 80 ppt. The amount of brine to add to each effluent concentration to obtain a final salinity of 34 $\pm$ 2 ppt is calculated using the following formula:

$$V_B = V_E \frac{(34 - S_E)}{(S_B - 34)}$$

V_B=Volume of Brine to add

V_E=Volume of Effluent to add

S_E=Salinity of Effluent
S_B=Salinity of Brine

Brine controls are used in all tests when salinity adjustment is necessary. The brine controls contain the same amount of brine added to the highest effluent concentration plus D.I. water equal to the amount of effluent added. The pH of all mixtures are adjusted to within 0.1 units of the dilution water by dropwise addition of dilute HCl or NaOH. For effluents with salinity greater than 10 ppt, or tests with effluent concentrations greater than 10%, the following formula is used to calculate the amount of D.I. to add:

$$V_B = V_E \frac{(34)}{(S_B - 34)}$$

The amount of D.I. to add is calculated by solving for V_E.

Effluent concentrations are prepared by combining effluent, hypersaline brine, and dilution water using the appropriate dilution factors. Concentrations are mixed from the lowest to the highest to avoid potential contamination.

REFERENCE TOXICANT CONCENTRATIONS

Stock solutions of copper chloride are prepared by Environmental Resource Associates in Arvada, Colorado. The 10,000-µg/l stock is traceable to NBS standards and is guaranteed stable for up to one year. The stock is discarded after this time. Five replicates and a sample for chemical and physical parameters are prepared by mixing 0.28, 0.5, 0.9, 1.6 and 2.8 ml with reference seawater in a 500-ml volumetric flask. Before each test, a sample of stock solution is sent to a local, certified laboratory for analysis to ensure the stock has not been contaminated.

SPAWNING OF ANIMALS

Urchins or sand dollars are rinsed off in clean seawater, injected with 1 ml of 0.5 M KCl through the peristomal membrane (0.5 ml through oral opening for sand dollars). Females are inverted over beakers to collect the eggs. Sperm is collected without dilution using a micropipette and placed in a small beaker on ice. The beaker should be covered with parafilm. Sperm should be checked for motility using a microscope. Sperm must be used within four hours. Eggs are rinsed into a large beaker and are washed two or three times with clean seawater (with settling allowed between washings).

DETERMINATION OF EGG DENSITY

A sample of eggs from each spawning female is inspected under a microscope, and batches containing immature, small, or misshapen eggs are discarded. The remaining batches of eggs are pooled and combined into a one-liter glass beaker. The eggs are suspended evenly into the solution, and a 1-ml sub-sample is removed and combined with 9 ml of seawater in a 10-ml graduated cylinder. This solution is also thoroughly mixed. A 1-ml sub-sample is again removed and added to a Sedgewick-Rafter slide, and eggs are counted microscopically. Counts should be between 200 and 245 eggs per ml. The stock solution is adjusted as needed to obtain the necessary concentration.

PREPARATION OF SPERM

A 0.025-ml sub-sample of sperm pooled preferably from four males is diluted with 100 ml of seawater and is thoroughly mixed. 9 ml of this solution is combined with 1 ml of acetic acid (to inactivate the sperm) and a 0.1 ml of solution is added to a hemacytometer. Hemacytometer counts should be between 51 and 408 using a five-square counting pattern, and, if not, the stock solution is adjusted.

TRIAL ESTIMATE OF FERTILIZATION

0.03 ml of sperm solution and 0.30 ml of egg suspension are combined with 3 ml of seawater. The embryos are inspected under a microscope, and if fertilization is greater than 80% the test is initiated. If lower, sperm and egg solutions are reprepared. An "egg blank" (with no sperm added) is also inspected in order to ensure that prefertilization has not occurred.

INOCULATION OF TEST CHAMBERS

Each test chamber is inoculated with 0.03 ml of sperm. After exactly 20 minutes following sperm addition, 0.30 ml of the egg solution is added to each chamber (in the same sequence as the sperm addition). Exactly 20 minutes following egg inoculation, 0.10 ml of 25% glutaldehyde is added to preserve the embryos.

EXAMINATION OF EMBRYOS

100 embryos from each well plate chamber are examined and scored as either fertilized or unfertilized depending upon the presence or absence of a vitelline membrane. Percent fertilization is recorded for each replicate.

TEST ACCEPTABILITY

1. Egg fertilization at the NOEC must be greater than 80% that of the controls.
2. The minimum significant difference is <25% relative to the controls.
3. The sperm count for the final sperm stock must not exceed 33,600,000/ml.
4. If the sperm count for the final sperm stock is between 5,600,000 and 33,600,000/ml it must not exceed 2X of the target density from the trial, or if no target density was specified for the test, the high sperm density controls (0.2-ml sperm stock) must have at least 5% higher fertilization than the low sperm density controls (0.05-ml sperm stock).
5. Dilution water egg blanks and effluent egg blanks should contain essentially no eggs with fertilization membranes.

REFERENCES

US EPA. 1995. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms.* EPA/600/R-95/136.

Chapman, G.A. 1994. *Sea urchin* (<u>Strongylocentrotus</u> <u>purpuratus</u>) *and sand dollar* (<u>Dendraster excentricus</u>) *fertilization test method*. USEPA. Newport, Oregon (draft).

Dinnel, P.J. et.al. 1987. *Improved methodology for sea urchin sperm cell bioassay for marine waters*. Archives of Environmental Contamination and Toxicology. 16:23-32.

Hunt, J., Anderson, B. *Abalone development: Short-Term Toxicity Test Protocol. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project*. State Water Res. Control Board. Sacramento (Current Ed.).

State Water Resources Control Board. 1996. *Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project.* 96-IWQ.

Revised 8/25/03

STANDARD OPERATING PROCEDURE FOR ACUTE EFFLUENT TOXICITY TESTS
(EPA 5th Ed. Methodology)

ENDPOINT DESCRIPTION

Juvenile fish or invertebrates are exposed to various concentrations of effluent for 24-96 hours. The endpoint is mortality.

DILUTION WATER

Water used for this test is reconstituted fresh or saltwater. Known amounts of reagent grade salts or standard sea salts are added to high quality D.I. water until the dilution hardness and alkalinity or salinity is equal to that of the effluent.

EFFLUENT CONCENTRATIONS

Test dilutions are typically prepared at 100%, 50%, 25%, 12.5%, and 6.25%. If needed, lower dilutions can be set at ranges where a dilution is at least 50% that of the next highest concentration. If the toxicity of the sample is unknown, a 24-hour preliminary range-finding test using a wider range of concentrations can be prepared. A control using the same dilution water is included with all tests.

Test chambers are new or pre-cleaned, glass beakers, ranging in size from 30-250 ml (depending upon the species chosen). For rainbow or brook trout, 5-liter disposable glass aquaria are used. Test solution volumes range from 25-200 ml (or 4 liters for trout). Each beaker or aquarium is labeled with a lab number and effluent concentration. Test containers are placed on wire racks in a constant temperature room of either 19-23 or 24-26 deg C (11-13 deg C for trout). Beginning with the lowest concentration, graduated cylinders are used to pour the proper amount of the well-mixed effluent in each beaker. Dilution water is then poured in each container to the desired volume.

Solutions are not aerated unless oxygen values fall below 4.0 mg/l (6.0 mg/l for trout). Rate of aeration should not exceed 100 bubbles per minute.

TEST ORGANISMS

Juvenile animals are obtained from licensed breeders or collectors (Thomas Fish Company at Anderson, Ca., Brezina and Associates at Dillon Beach, Ca., or Aquatox in Hot Springs, Arkansas and are delivered by Greyhound bus, UPS, or Federal Express. Upon arrival, the condition of the animals and number of mortalities during shipment are recorded.

Ages of organisms used and test temperatures in bioassays are:

Ceriodaphnia dubia	less than 24 hours@25ºC
Daphnia spp.	less than 24 hours@25ºC
Pimephales promelas	1-14 days; less than or equal to 24-hrange in age @ 25ºC
Oncorhynchus mykiss	15-30 days (after yolk sac absorption to 30 days) @ 12ºC
Mysidopsis bahia	1-5 days; less than or equal to 24-h range in age, @20ºC ± 1ºC or 25ºC ± 1ºC, Salinity @5-30ppt ± 10%
Menidia beryllina	9-14 days; less than or equal to 24-h range in age, @20ºC ± 1ºC or 25ºC ± 1ºC, Salinity @1-32ppt ± 10%

Holmesimysis costata	3-4 days post-hatch juveniles; @15ºC ± 1ºC, Salinity @34ppt ± 2ppt
Atherinops affinis	7-15 days @21ºC, Salinity @10-30ppt
Hyalella azteca	7-14days, 1-2 day range in age, @23 ± 1°C

PERCENT SURVIVAL TESTS

Occasionally, only a percent survival test in undiluted effluent is required. The same procedures apply in this test as a standard bioassay, except that only undiluted waste and the control are used. Tests are reported as percent survival in undiluted sample instead of LC50.

CHEMICAL AND PHYSICAL PARAMETERS

Dissolved oxygen, pH, and temperature are measured in all controls and concentrations before introducing fish, and at 24-hour intervals thereafter. The hardness and alkalinity are measured in the control and highest concentration at the beginning and end of each test. Residual chlorine and conductivity or salinity are measured in the control and highest treatment concentration at the beginning of the test. Calibrated thermographs continuously record temperatures throughout the test. A uniform photoperiod of 16 hours light and 8 hours dark at an intesity of 50-100 foot-candles is maintained.

DELIVERY OF ORGANISMS AND TEST DURATION

Within one hour after the preparation of test solutions, typically 10 randomly chosen animals are delivered to each duplicate test tank using a small-mesh dip-net or disposable pipette (total of 20 animals per concentration). The test begins when animals are introduced into the test chambers and continues for 24, 48, or 96 hours, depending upon requirements. Test solutions are renewed at 48 hours. Animals are fed at 48 hours, with the exception of *Oncorhynchus mykiss* which are not fed and *Mysidopsis bahia and Hyalella azteca* are fed 0.2 mL concentrated suspension of Artemia nauplii ≤ 24-h old daily, if the test lasts longer than this. Mortalities and chemical measurements are recorded every 24 hours, and dead animals are removed as soon as they are observed. Excess food is removed after feeding.

DISPOSAL OF FISH AND TANKS

At the end of the test, animals are destroyed before being disposed of by placing them in a zip-lock bag with ethanol. Effluents are poured down the drain unless they are highly toxic, in which case the client is asked to pick up the sample and any dilutions. Test tanks and aeration pipets are broken down and disposed of at a local landfill.

ANALYSIS

A review of concentration-response relationships is conducted on all multi-concentration tests following guidelines in EPA821-B-00-004, July 2000, *Method Guidance and Recommendations for Whole Effluent Toxicity (Wet) Testing (40 CFR Part 136).*

The flowchart shown in Figure 6 of the method reference (USEPA 2002) is used for determining the LC_{50} statistical test. When an LC_{50} can be determined, the toxicity of the waste is also expressed as toxic units, where:

$$TC(tu) = \frac{100}{\text{96-hr } LC_{50}}$$

When there is less than 50% mortality in 100% waste, the toxic units are expressed as:

$$TC(tu) = \frac{\text{Log (\% Mortality)}}{1.7}$$

TEST VALIDITY

1) Mortality cannot exceed 10% in the controls.
2) Test must be set within 36 hours of collection.
3) D.O. above or equal to 4 mg/l (6 mg/l for trout).
4) Loading limits must not exceed 1.1 g/l at 25 deg C, 0.65 g/l at 20 deg C, and 0.4 g/l at 25 deg C.

REFERENCES

USEPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. (5th ed). EPA-821-R-02-012.

EPA-821-B-00-004, July 2000, *Method Guidance and Recommendations for Whole Effluent Toxicity (Wet) Testing (40 CFR Part 136).*

EPA 600/R-99/064, March 2000, *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates Waters to Freshwater and Marine Organisms*. (2nd ed)

Revised 12/7/04

STANDARD OPERATING PROCEDURES FOR RED ABALONE TOXICITY TEST

ENDPOINT DESCRIPTION

Fertilized eggs of the red abalone, *Haliotis rufescens*, are exposed to various effluent concentrations and allowed to develop into veliger larvae. The endpoint is the proportion of normal verses abnormal larval development after 48 hours.

DILUTION WATER

Three types of water may be used as a dilution source: 1) receiving water: seawater collected from areas around the vicinity of outfall. 2) Natural, 1 um filtered, UV sterilized salt water from a mariculture facility in Oxnard, California. 3) Reconstituted sea salts using "Tropic Marin" brand sea salts and highly purified D.I. water.

All reference toxicant tests use the same water source each time a test is conducted. Water is obtained in the open ocean near Anacapa Island and is filtered through a 0.2 um filter. Water is collected in new five gallon cubitainers prior to testing and stored at 15 deg C.

EFFLUENT CONCENTRATIONS

Five concentrations, a control and a brine control (if salinity adjustment is needed) each with five replicate test chambers are used. One of the five chambers is analyzed for chemical/physical parameters at the beginning and end of the test. The chambers used are 70 ml sterile Corning plastic culture flasks with screw caps. All flasks are rinsed with reference sea water and numbered for randomization before solutions are prepared.

Glassware cleaning procedure:

2. Wash in warm, soapy water.
3. Rinse with tap water.
4. Rinse with reagent grade acetone.
5. Rinse with D.I. water.
6. Soak in 3N HCL for 24 hours.
7. Rinse with D.I. water.
8. Rinse with 2N HNO_3.
9. Rinse with D.I. water.
10. Soak in D.I. water for 24 hours.
11. Rinse with D.I. water.
12. Air dry.

All glassware is rinsed with reference seawater prior to mixing concentrations. A 1000 ml glass volumetric flask, various sizes of volumetric pipettes, and a 250 ml graduated cylinder are used to prepare solutions. A total volume of 1000 ml is needed for each solution. Effluent concentrations are typically set according to client requirements.

For concentrations above 2%, a brine is used to adjust salinity. Six to eight liters of reference seawater are frozen 48 hours before the test. After 24 hours, the water is allowed to partially thaw for about one hour and the liquid is combined into a 1-liter container. If the salinity is not between 60 and 80 ppt, the container is frozen again for 24 hours. After an hour of thawing, the water is separated from the ice. The salinity is then usually between 60 and 80 ppt.

The amount of brine to add to each effluent concentration to obtain a final salinity of 34 $\pm$ 2 ppt is calculated using the following formula:

$$V_B = V_E \frac{(20 - S_E)}{(S_B - 20)}$$

V_B=Volume of Brine to add
V_E=Volume of Effluent to add
S_E=Salinity of Effluent
S_B=Salinity of Brine

Brine controls are used in all tests when salinity adjustment is necessary. The brine controls contain the same amount of brine added to the highest effluent concentration plus D.I. water equal to the amount of effluent added and filled to the 1-liter mark with reference seawater. The pH of all brine mixtures are checked and adjusted to within 0.1 units of the dilution water by dropwise addition of dilute HCl or NaOH.

Effluents with a salinity greater than 10 ppt, or tests with effluent concentrations greater than 10% use the following formula to calculate the amount of D.I. to add:

$$V_B = V_E \frac{(20)}{(S_B - 20)}$$

The amount of D.I. to add is calculated by solving for V_E.

Effluent concentrations are prepared by combining effluent, hypersaline brine and dilution water using the appropriate dilution factors. Concentrations are mixed from the lowest to the highest to avoid any possible contamination.

REFERENCE TOXICANT CONCENTRATIONS

Stock solutions of zinc sulfate ($ZnSO_4$) are prepared by Environmental Resource Associates in Arvada, Colorado. The 10,000 ug/l stock is traceable to NBS standards and is guaranteed stable for one year. After one year, it is discarded. A reference test is performed concurrently with each effluent test. A sample of stock is analyzed by a local, certified laboratory at the time of the test to ensure there is no contamination of the stock solution.

Reference toxicant solutions consist of five replicates of 0 (control), 18, 32, and 56 ug/l zinc sulfate. One replicate is used for measuring chemical/physical parameters. Concentrations are obtained by mixing 1.8, 3.2 and 5.6 ml of 10,000 ug/l Stock in a 1-liter volumetric flask.

OBTAINING EMBRYOS

Test embryos are usually obtained from the abalone hatchery on the day of the test. Test concentrations are being mixed while the animals are spawning. The beginning test temperature depends on the spawning temperature (ambient ocean water). There is never more than a 1 deg C difference between the two temperatures.

Immediately after fertilization, the embryos are checked for sperm/egg ratio (<100), rinsed, condensed into a one gallon plastic bottle, wrapped in newspaper, placed in an ice chest, and transported to the laboratory (15-20 minutes). Embryos are poured in a 1-l cylinder and gently mixed with a perforated plunger. Five replicate counts of evenly suspended embryos are made with a 1-ml wide bore pipet.

Embryo density is adjusted by either diluting, or by settling and pouring off excess water to obtain a density between 200 and 300 embryos/ml. The tests conducted with embryos are initiated within one hour of fertilization.

SPAWNING ABALONE

Occasionally, the hatchery cannot spawn when a test needs to be conducted. When this occurs, abalone broodstock are obtained from a local aquaculture source and held in the laboratory for one week prior to spawning. The holding tanks are cleaned daily of any uneaten food and/or fecal material and the organisms are fed an ample supply of fresh kelp. Fresh, altered seawater is exchanged at a 50:50 ratio with tank water every other day. After the animals are spawned, they are returned for reproductive conditioning under flow-through conditions.

The day before the test, four male and four female abalone are rinsed off in 1-um filtered seawater and separately placed into two 30-liter buckets with aerated seawater.

Three hours prior to spawning, abalone are transferred to clean five gallon buckets filled with six liters of aerated, 1-um filtered seawater.

12.1 gm of Tris is dissolved into 50 ml D.I. water. After the Tris has dissolved, H2O2 is prepared by pouring 10 ml H_2O_2 (30%) into 40 ml D.I. water (1:5 dilution). 25 ml of Tris and 25 ml of H_2O_2 are then poured into each bucket and mixed well. Abalone are exposed for 2.5 hours at 15 deg C.

Both buckets are emptied, rinsed and refilled to the top with fresh 1 um filtered seawater. The abalone begin spawning about 3 hours after chemical introduction. If spawning occurs before chemicals have been removed, buckets are immediately drained, rinsed, and refilled.

FERTILIZATION

As females spawn, eggs settle to the bottom. The water is gently swirled to make an even layer without allowing eggs to come in contact with each other. Clumps of eggs are removed. When a sufficient number of eggs have been obtained, or one-half hour has passed since first male spawn, the eggs are siphoned into a third bucket with one liter of filtered seawater. As males spawn, sperm directly above the respiratory pore is collected into a 500 ml flask. Sperm is collected every 15 minutes until spawning is complete. The freshest sperm is used to fertilize eggs.

When enough eggs have been collected, about 200 ml of sperm-laden water is poured into the bucket containing eggs. The mixture is then gently swirled with a low flow of seawater to allow fertilization. When the bucket is half full, water flow is stopped and eggs settle to the bottom of the bucket. Immediately after fertilization, the water is carefully siphoned off as much as possible without disturbing the eggs. The bucket is then filled again with seawater and embryos are allowed to settle. Eggs are then siphoned into a 1 liter beaker. Eggs are examined under the microscope to make certain they have not been over-fertilized. One to 100 sperm should be visible around a single egg. If there is a great number of sperm/egg (>1000), the eggs will not develop and must be discarded.

The eggs are mixed in the beaker using a perforated plunger. The density is obtained by taking five counts of a 1 ml subsample of eggs and averaging the counts. The density is adjusted if necessary to obtain 200 to 300 eggs per ml. The above two steps must be completed within one hour.

PREPARATION FOR RESIDUAL CHLORINE TESTS

When residual chlorine is the toxicant of concern, the required volume of dilution water is added to the test containers first, and the fertilized abalone eggs are then added to the dilution water. An effluent sample is dosed with the required concentration of chlorine, and after the appropriate decay time, the effluent is added to the testing containers.

DELIVERY OF FERTILIZED EGGS

The volume of water that will contain 1,000 embryos is calculated and added to each container using a 10 ml wide bore pipet. After the eggs have been delivered to test chambers, a portion is examined to verify they are still in the one-cell stage.

INCUBATION

Sample flasks are capped and laid flat under low lighting (approximately 100 lux) at 15 deg C with a 16 hour light and 8 hour dark photoperiod for 48 hours.

CHEMICAL AND PHYSICAL PARAMETERS

A numbered flask from each concentration is used to analyze temperature daily; and pH, dissolved oxygen, and salinity at the beginning and end of the test. After the embryos are added, the flask is set upright to allow maximum settling. A small amount of water is poured into a 100 ml beaker and instrument probes are placed into the beaker. After recording the chemical values, the sample is poured back in the flask and placed on the shelf flat side down. Thermo-graphs continuously record temperatures in the incubator room throughout the testing period.

SAMPLE PRESERVATION

At the end of 48 hours, samples are preserved with 10 ml of 37% formalin, sealed, gently shaken, and stored flat side down for counting.

ANALYSIS

An inverted scope, adjusted to 100x, is used to examine the first 100 larvae encountered in each flask. Before placing a flask on the scope, it is gently swirled then allowed to settle for 15 minutes. Hand counters are used for counting larvae. Normal development is determined from comparisons with MSPL photographs or written descriptions (see below):

1) Normal: smooth, round shells with multiple striations. Shell somewhat opaque.
2) Abnormal:
    a) thin shell with multiple indentations.
    b) larva with arrested development (one cell through trocophore)
    c) larvae encased in egg membranes that otherwise appear as normal veligers.
    d) broken shell or shells separated from the rest of animal.

DATA ANALYSIS

The Toxcalc statistical program is used to evaluate data. The proportion of normal abalone is determined in each container and the data is arsine, square-root transformed. ANOVA is used to compare concentrations and Dunnett's Test compares concentrations to the control which determines the NOEC.

TEST ACCEPTABILITY

Control and brine control larval abnormality cannot exceed 20% in either effluent or toxicant test.

1) Response from 56 ug/l must be significantly different from the control response.
2) Variability between replicates must be low enough that ANOVA mean square (does not exceed 100 in either effluent or reference toxicant test.)

REFERENCE

US EPA. *1995. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*. EPA/600/R-95/136

Hunt, J., Anderson,B. *Abalone development: Short-Term Toxicity Test Protocol. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project.* State Water Res. Control Board. Sacramento (current ed).

State Water Resources Control Board. 1996. *Procedures Manual for Conducting Toxicity Test Developed by the Marine Bioassay Project*. 96-IWQ.

Revised 3/26/04

Attachment C-11-II

Chemistry Sampling Results for the Mass Emissions Stations

Water Chemistry at Mass Emissions Sites

Site	Composite Time Begin	Composite Time End	Samples Type	Samples #	SC	pH	T	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
					µS		°C	mg/L	NTU	µS								mg/L				ng/L				µg/L						mg/L
Aliso Creek in Aliso/Wood Canyon Park																																
ACJ01	11/1/03 2:34	11/1 3:34	SF	6																			<1	<8	4.5	<2	56	<2	13			
ACJ01	11/1/03 2:34	11/1 3:34	ST	6	1525	8.11	17.1	8.79	181	2980	7.9	11	0.495	5.1	4.91	0.671	440	74	134	<5	<5	196	40	17	49	8.8	140	<2	350			940
ACJ01	11/1/03 5:34	11/1 23:34	SF	10																			<1	<8	6.8	<2	23	<2	22			
ACJ01	11/1/03 5:34	11/1 23:34	ST	10	2736	8	15.9	8.7	112	2240	7.9	10	0.57	4	2.46	0.322	170	36	212	<5	<5	377	7.1	<8	31	4.8	39	<2	120			660
ACJ01	11/2/03 1:34	11/3 7:34	SF	16																			<1	<8	6.3	<2	28	<2	17			
ACJ01	11/2/03 1:34	11/3 7:34	ST	16					12	2790	8.1	6.6	0.236	2	1.54	0.403	15	<10	140	<5	<5	134	1.9	<8	7.9	<2	28	<2	26			848
ACJ01	11/3/03 11:34	11/5 9:34	SF	24																			1.2	<8	13	<2	37	<2	22			
ACJ01	11/3/03 11:34	11/5 9:34	ST	24	2580	8.2	14.1	20.1	5.2	2820	8.2	7.5	0.188	1.2	1.29	0.307	<10	<10	128	<5	<5	144	2.4	<8	8.7	<2	38	<2	26			900
ACJ01	2/18/04 15:51	2/18 16:51	SF	6																			1.4	<8	8.4	<2	30	<2	70			
ACJ01	2/18/04 15:51	2/18 16:51	ST	6															268	<5	<5	213	8	10	19	3.5	49		90			
ACJ01	2/18/04 18:51	2/20 4:51	SF	15																			<1	<8	5.7	<2	15	2.4	20			
ACJ01	2/18/04 18:51	2/20 4:51	ST	15	2105	7.89	13.3	13.2	36	1610	7.7	6.2	0.114	1.3	1.17	0.243	62	12	250	<5	<5	500	1.8	<8	13	2.5	21	<2	57			500
ACJ01	2/20/04 10:51	2/22 2:51	SF	21																			<1	<8	7.6	<2	26	<2	17			
ACJ01	2/20/04 10:51	2/22 2:51	ST	21	430	8.21	12.4	12.7	6	2460	8.1	6.2	<0.05	0.69	0.829	0.229	<10	<10	48.4	<5	<5	76.8	1.6	<8	6.5	<2	24	<2	34			830
ACJ01	2/22/04 4:51	2/24 8:51	SF	27																			<1	<8	5.9	<2	13	<2	87			
ACJ01	2/22/04 4:51	2/24 8:51	ST	27	1627	8	13.5	12.3	60	999	7.8	4.8	0.097	1.2	1.54	0.253	120	19	59.8	<5	<5	57.2	2.3	8.6	20	3.7	20	<2	61			322
ACJ01	2/3/04 0:18	2/3 22:18	SF	10																			<1	<8	6.9	<2	11	<2	86			
ACJ01	2/3/04 0:18	2/3 22:18	ST	10	2430	7.41	11.9	10.2											<5	<5	<5	<5	3	<8	21	6.1	22	<2	110			380
ACJ01	2/3/04 14:18	2/4 8:18	SF	10																			<1	<8	9.7	<2	15	<2	38			
ACJ01	2/3/04 14:18	2/4 8:18	ST	10	2836	7.77	12.4		15	2080	8.1	6.2	0.075	1.3	1.26	0.294	16	<10	62.1	<5	<5	<5	1.3	<8	8.2	<2	15	<2	18			608
ACJ01	2/4/04 8:50		D		2430	7.4	11.9	10.2																								
ACJ01	2/6/04 10:00		D		2836	7.8	12.4																									
ACJ01	2/6/04 10:18	2/7 2:18	SF	9																			1	<8	4.7	<2	24	<2	12			
ACJ01	2/6/04 10:18	2/7 2:18	ST	9	2991	8.11	11.6	11.6	5.3	2980	8.1	6.2	0.054	0.83	0.798	0.207	<10	<10	58.1	<5	<5	<5	1.7	<8	6.2	<2	23	<2	17			950
ACJ01	2/7/04 0:00		DF																				1	<8	4.7	<2	24	<2	12			
Laguna Canyon Channel at Woodland																																
LCWI02	2/18/04 14:44	2/18 15:44	SF	6																			<1	<8	**91**	3.7	5.4	<2	**190**			
LCWI02	2/18/04 14:44	2/18 15:44	ST	6	1436	8.3	11.8	18.9	762	609	7.5	6.2	<0.05	3.7	4.6	0.258	2200	210	<5	<5	<5	<5	<1	76	83	22	63	<2	210			168
LCWI02	2/18/04 17:44	2/19 1:44	SF	12																			<1	<8	7.8	<2	<4	<2	15			
LCWI02	2/18/04 17:44	2/19 1:44	ST	12	5788	8.15	13.1	11	30	1000	8.3	1.9	<0.05	0.93	0.798	0.213	48	<10	119	<5	<5	<5	<1	<8	8.8	<2	5.2	<2	22			320
LCWI02	2/2/04 18:52	2/2 19:52	SF	6																			<1	<8	24	<2	4.4	<2	67			
LCWI02	2/2/04 18:52	2/2 19:52	ST	6															176	<5	<5	<5	<1	<8	37	7.2	7.6	<2	99			320
LCWI02	2/2/04 21:52	2/3 19:52	ST	12	1574	7.87	10.1	14.6	66	762	8.1	4.1	<0.05	1.3	1.87	0.359	400	39	<5	<5	<5	<5	<1	<8	22	6.5	8.9	<2	64			200
LCWI02	2/2/04 21:52	2/3 19:52	SF	12																			<1	<8	11	<2	<4	<2	54			
LCWI02	2/20/04 9:44	2/22 1:44	SF	21																			<1	<8	9.9	<2	<4	<2	13			
LCWI02	2/20/04 9:44	2/22 1:44	ST	21	1700	8.1	11.9	16.5	5.1	1540	8.6	0.57	<0.05	0.41	0.368	0.087	<10	<10	19.7	<5	<5	<5	<1	<8	6.6	<2	<4	<2	17			612
LCWI02	2/22/04 3:44	2/22 13:44	SF	6																			<1	<8	10	<2	<4	<2	47			
LCWI02	2/22/04 3:44	2/22 13:44	ST	6	770	9	13.7	16.3	23	801	8.3	2.6	<0.05	0.79	1.11	0.251	36	<10	40.4	<5	<5	16.6	<1	<8	9	<2	4.7	<2	20			242
LCWI02	2/3/04 21:52	2/4 19:52	SF	12																			<1	<8	6.8	<2	<4	<2	19			
LCWI02	2/3/04 21:52	2/4 19:52	ST	12	1839	8.41	9.31		6.7	1460	8.4	1.5	<0.05	0.55	0.706	0.171	<10	<10	27.3	<5	<5	<5	<1	<8	5.7	<2	<4	<2	<10			412
LCWI02	2/4/04 21:52	2/7 7:52	SF	30																			<1	<8	3.1	<2	<4	<2	<10			
LCWI02	2/4/04 21:52	2/7 7:52	ST	30	2021	7.7	7.2	13.8	2	1830	8.5	0.79	<0.05	0.46	0.368	0.121	<10	<10	<5	<5	<5	<5	<1	<8	3.5	<2	<4	<2	<10			450
LCWI02	2/7/04 0:00		DF																				<1	<8	3.1	<2	<4	<2	<10			

Water Chemistry at Mass Emissions Sites

Site	Composite Time Begin	End	Samples Type	#	SC	pH	T	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
					mS		°C	mg/L	NTU	mS								mg/L				ng/L					mg/L					mg/L
Prima Deschecha at Calle Grande Vista																																
PDCM01	11/1/03 2:20	11/1 3:20	SF	6																			1.2	<8	12	<2	60	<2	81			
PDCM01	11/1/03 2:20	11/1 3:20	ST	6					94	2050	7.7	28	2.28	9.1	0.123	0.229	68	20	445	<5	<5	3120	8.1	<8	29	4.1	69	<2	170			580
PDCM01	11/1/03 9:53	11/2 1:53	SF	10																			9.7	<8	6.3	<2	83	<2	41			
PDCM01	11/1/03 9:53	11/2 1:53	ST	10	6590	8	15.4	11.1	14	7280	8.2	18	0.062	1.7	1.32	0.306	23	<10	136	<5	<5	33.7	11	<8	10	<2	95	<2	58			2140
PDCM01	11/2/03 3:53	11/3 7:53	SF	9																			12	<8	6	<2	91	<2	41			
PDCM01	11/2/03 3:53	11/3 7:53	ST	9					14	7340	8.1	13	<0.05	1	1.04	0.225	20	<10	130	<5	<5	<5	15	<8	11	<2	99	<2	71			2104
PDCM01	11/3/03 9:53	11/5 7:53	ST	24	7349	8.06	14.3	11.2	27	7890	8	15	0.053	1.3	1.11	0.195	44	<10	1100	<5	<5	2450	16	<8	18	<2	120	<2	72			2388
PDCM01	11/5/03 8:25		SF																				14	<8	10	<2	110	<2	52			
PDCM01	2/18/04 15:04	2/18 16:04	SF	6																			<1	<8	11	<2	12	<2	120			
PDCM01	2/18/04 15:04	2/18 16:04	ST	6	5788	8.15	13.1	11	320	545	7.1	5.3	0.562	4.4	3.38	0.139	1090	130	461	<5	<5	878	4.1	17	40	8.8	36	<2	210			154
PDCM01	2/18/04 18:04	2/20 4:04	SF	18																			8.8	<8	11	<2	76	<2	66			
PDCM01	2/18/04 18:04	2/20 4:04	ST	18	5788	8.2	13.1	11	12	4670	8	15	0.115	1.4	0.921	0.19	13	<10	101	<5	<5	448	10	<8	20	2.3	84	<2	120			1408
PDCM01	2/2/04 22:54	2/2 23:54	SF	6																			<1	<8	5.6	<2	11	<2	100			
PDCM01	2/2/04 22:54	2/2 23:54	ST	6								6.2	0.425	2.1	2.52				106	<5	<5	285	3.4	16	24	5.1	30	<2	110			218
PDCM01	2/20/04 10:04	2/21 20:04	SF	18																			11	<8	9.8	<2	90	<2	36			
PDCM01	2/20/04 10:04	2/21 20:04	ST	18	2795	8	13.5	10.6	37	5870	8.1	14	<0.05	1	0.675	0.099	<10	<10	25.4	<5	<5	23.7	13	<8	16	<2	95	<2	69			1770
PDCM01	2/22/04 0:04	2/22 14:04	SF	8																			5.6	<8	13	<2	55	<2	110			
PDCM01	2/22/04 0:04	2/22 14:04	ST	8	4019	7.9	13.4	11.8	33	2740	7.4	11	0.263	1.6	0.768	0.115	58	10	60.8	<5	<5	133	6.3	<8	19	<2	57	3.6	78			868
PDCM01	2/3/04 1:54	2/3 23:54	SF	12																			6.1	<8	5.3	<2	68	<2	39			
PDCM01	2/3/04 1:54	2/3 23:54	ST	12					38	4670	7.9	18	0.509	2.5	1.11	0.207	65	13	75.9	204	<5	<5	8.7	<8	11	<2	75	<2	70			1430
PDCM01	2/4/04 1:54	2/5 19:54	SF	22																			11	<8	5.7	<2	83	<2	58			
PDCM01	2/4/04 1:54	2/5 19:54	ST	22	7911	7.85	10.2	9.68	17	6020	8	15	0.502	3.6	0.583	0.08	22	<10	<5	<5	<5	<5	12	<8	7.9	<2	84	<2	75			1822
PDCM01	2/4/04 9:15		D		6447	8	12.2	15.2																								
PDCM01	2/5/04 21:54	2/7 1:54	SF	15																			18	<8	14	<2	140	<2	79			
PDCM01	2/5/04 21:54	2/7 1:54	ST	15	7410	8	9.9	11.7	8.4	8450	8.1	19	0.102	1.4	0.522	0.112	13	<10	51.4	<5	<5	<5	18	<8	15	<2	130	<2	100			1764
PDCM01	2/7/04 0:00		DF																				18	<8	14	<2	140	<2	79			
Secunda Deschecha at El Camino Real																																
SDCM02	2/20/04 8:37	2/21 18:37	SF	18																			7	<8	7.3	<2	330	<2	70			
SDCM02	2/20/04 8:37	2/21 18:37	ST	18	634	8.2	13.1	10.2	14	4230	8.2	66	0.116	0.91	0.46	0.064	34	<10	30	<5	<5	<5	24		9.4		330		110			1370
SDCM02	2/21/04 20:37	2/22 8:37	SF	7																			2.4	<8	12	<2	54	<2	150			
SDCM02	2/21/04 20:37	2/22 8:37	ST	7	2382	8.2	12.3	10.6	106	1580	7.7	15	0.131	1.6	1.35	0.193	170	28	81.1	<5	<5	55.6	7.6	13	28	4.8	71	<2	120			456
SDCM02	2/3/04 10:55		D		6989	8.17	13.3	10.5	219	2320	8	10	0.113	2.1	2.46	0.389	270	32	<5	<5	<5	<5	3.3	8.1	13	<2	38	<2	40			
SDCM02	2/3/04 10:55		DF																				1	<8	5.9	<2	27	<2	<10			

Water Chemistry at Mass Emissions Sites

Site	Composite Time Begin	Composite Time End	Samples Type	Samples #	SC	pH	T	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
					mS		°C	mg/L	NTU	mS								mg/L				ng/L				mg/L						mg/L
San Juan Creek at La Novia																																
SJNL01	11/1/03 0:45	11/1 1:45	SF	6																			<1	<8	7.2	<2	10	<2	23			
SJNL01	11/1/03 0:45	11/1 1:45	ST	6	1395	8.2	17.6	8.35	203	1440	7.5	6.2	0.669	7.5	1.44	0.376	520	140	278	<5	<5	1490	3.2	29	370	29	44	<2	540			370
SJNL01	11/1/03 3:45	11/1 11:45	SF	16																			<1	<8	3.7	<2	8	<2	<10			
SJNL01	11/1/03 3:45	11/1 11:45	ST	16					214	2030	7.7	4	0.243	6.4	3.07	0.152	620	120	282	<5	<5	<5	2.8	13	76	9.7	28	<2	140			622
SJNL01	11/12/03 2:16	11/12 3:16	SF	6																			<1	<8	6.4	<2	5.7	<2	43			
SJNL01	11/12/03 2:16	11/12 3:16	ST	6	1195	8.36	16.7	11.8	20	2400	7.7					0.401	130	32	48.6	<5	<5	<5	<1	<8	24	<2	9.7	<2	43			
SJNL01	11/12/03 5:16	11/13 3:16	SF	12																			<1	<8	4	<2	5	<2	42			
SJNL01	11/12/03 5:16	11/13 3:16	ST	12	1195	8.36	16.7	11.8	15	2300	7.7	2.5	0.234	1.8	2.52	0.408	50	16	45.8	<5	<5	<5	<1	<8	12	<2	6.9	<2	25			
SJNL01	11/12/03 5:56	11/13 3:56	ST	12	1195	8.36	16.7	11.8																								
SJNL01	11/13/03 11:16	11/15 9:16	SF	24																			<1	<8	<2	<2	<4	<2	<10			
SJNL01	11/13/03 11:16	11/15 9:16	ST	24	1940	8.1	15	14	4.3	2050	7.9	<0.44	0.081	0.58	0.768	0.051	15	<10	<5	<5	<5	<5	<1	<8	3.3	<2	<4	<2	<10			718
SJNL01	11/2/03 13:45	11/3 7:45	SF	14																			<1	<8	6.6	<2	11	<2	<10			
SJNL01	11/2/03 13:45	11/3 7:45	ST	14	2313	7.77	14.3	9.22	36	3230	8	2.9	0.211	1.7	1.29	0.24	84	22	137	<5	<5	<5	<1	<8	19	3.9	12	<2	35			892
SJNL01	11/3/03 9:45	11/5 7:45	SF	24																			<1	<8	5.6	<2	9.8	<2	18			
SJNL01	11/3/03 9:45	11/5 7:45	ST	24	2965	7.64	14.6	9.8	16	3410	7.9	1.8	0.11	<0.2	1.47	0.212	40	<10	76.3	<5	<5	220	<1	<8	13	<2	10	<2	23			1010
SJNL01	2/18/04 18:07	2/19 16:07	SF	12																			<1	<8	14	<2	<4	<2	38			
SJNL01	2/18/04 18:07	2/19 16:07	ST	12	1387	8	12.5	10.1	21	1250	7.9	5.3	<0.05	0.87	0.553	0.127	20	<10	70.7	<5	<5	136	<1	<8	13	6.9	<4	<2	36			380
SJNL01	2/2/04 23:40	2/3 19:40	SF	11																			<1	<8	6.4	<2	<4	<2	18			
SJNL01	2/2/04 23:40	2/3 19:40	ST	11					39	1190	7.9	5.3	<0.05	0.91	0.952	0.205	49	10	<5	<5	<5	<5	<1	<8	2.9	<2	<4	<2	<10			372
SJNL01	2/20/04 9:57	2/21 1:57	SF	9																			<1	<8	5.9	<2	<4	<2	38			
SJNL01	2/20/04 9:57	2/21 1:57	ST	9	1253	7.8	13.5	10.5											19.9	<5	<5	<5	<1	<8	7.8	<2	<4	2.6	29			462
SJNL01	2/21/04 3:57	2/22 17:57	SF	9																			<1	<8	5.3	<2	<4	<2	82			
SJNL01	2/21/04 3:57	2/22 17:57	ST	9	1186	8.1	13	13.7	70	991	7.9	7.9	<0.05	1.3	1.54	0.266	120	24	55.5	<5	161	<5	<1	<8	24	3	6.8	<2	39			312
SJNL01	2/3/04 18:02	2/4 8:02	SF	8																			<1	<8	6.2	<2	<4	<2	<10			
SJNL01	2/3/04 18:02	2/4 8:02	ST	8	1537	7.86	9.66	15.6	8	1330	8.1	6.6	<0.05	0.66	0.614	0.142	10	<10	<5	<5	<5	<5	<1	<8	7.3	<2	<4	<2	<10			420
SJNL01	2/4/04 10:02	2/6 20:02	SF	30																			<1	<8	4.5	<2	<4	<2	<10			
SJNL01	2/4/04 10:02	2/6 20:02	ST	30	1497	7.9	9.4	10.9	1.9	1500	8	6.2	<0.05	0.34	0.215	0.061	<10	<10	<5	<5	<5	<5	<1	<8	5.9	<2	<4	<2	<10			484
SJNL01	2/4/04 9:48		D		1327	7.8	11.2	14.8																								
SJNL01	2/7/04 0:00		DF																				<1	<8	4.5	<2	<4	<2	<10			

Water Chemistry at Mass Emissions Sites

Site	Composite Time Begin	Composite Time End	Samples Type	Samples #	SC	pH	T	DO	Turbidity	Specific Conductance	pH	Nitrate as NO_3	Ammonia as N	TKN	Tot Phosphate as PO_4	ortho phosphate as P	TSS	VSS	Diazinon	Chlorpyrifos	Dimethoate	Malathion	Cd	Cr	Cu	Pb	Ni	Ag	Zn	As	Se	Hardness as $CaCO_3$
					µS		°C	mg/L	NTU	µS								mg/L				ng/L					µg/L					mg/L
Trabuco Creek at Del Obispo																																
TCOL02	10/31/03 21:13	10/31 22:31	SF	6																			<1	<8	6.7	<2	5.6	<2	39			
TCOL02	10/31/03 21:13	10/31 22:31	ST	6	1096	8.19	16.4	10.6	101	653	7.6	7	0.81	3.8	2.21	0.358	200	42	978	<5	<5	<5	<1	<8	32	12	11	<2	150			180
TCOL02	11/1/03 0:13	11/1 10:13	SF	6																			<1	<8	6.1	<2	10	<2	110			
TCOL02	11/1/03 0:13	11/1 10:13	ST	6	1710	8.22	11.1	11.1	1072	1540	7.9	6.6	0.623	4.7	2.79	0.15	5240	370	286	<5	<5	771	3.8	20	46	16	29	<2	150			478
TCOL02	11/12/03 10:24	11/13 8:24	SF	12																			<1	<8	6.4	<2	5.4	<2	30			
TCOL02	11/12/03 10:24	11/13 8:24	ST	12					19	1600	8.1	4.4	<0.05	1.1	0.982	0.113	74	11	120	<5	<5	112	<1	<8	11	<2	7.3	<2	24			548
TCOL02	11/12/03 7:24	11/12 8:24	SF	6																			<1	<8	5.2	<2	8.3	<2	32			
TCOL02	11/12/03 7:24	11/12 8:24	ST	6	1400	8	15.6	14.1				0.53	<0.05	1.3	4.91	0.026			53.5	<5	<5	<5	1.5	<8	25	2.7	26	<2	86			950
TCOL02	11/13/03 10:24	11/15 8:24	SF	24																			<1	<8	4.8	<2	5.7	<2	<10			
TCOL02	11/13/03 10:24	11/15 8:24	ST	24	1670	8.5	15.3	15.1	3.6	1660	8.4	4.8	<0.05	0.66	0.338	0.086	13	<10	166	<5	<5	<5	<1	<8	5.8	<2	6.1	<2	<10			550
TCOL02	11/3/03 8:13	11/5 8:13	SF	24																			<1	<8	7.9	<2	7	<2	<10			
TCOL02	11/3/03 8:13	11/5 8:13	ST	24	2049	8.31	18.9		4.2	2030	8.3	4.3	0.06	1.6	0.46	0.077	<10	<10	73.5	<5	<5	<5	<1	<8	6.7	<2	7.3	<2	<10			674
TCOL02	11/5/03 10:43		SF																				<1	<8	7.9	<2	7	<2	<10			
TCOL02	2/18/04 15:08	2/18 16:08	SF	6																			<1	<8	13	<2	4.1	<2	92			
TCOL02	2/18/04 15:08	2/18 16:08	ST	6								4.1	0.426	3.3	1.41				<5	<5	<5	<5	1	12	40	17	13	2.3	200			138
TCOL02	2/18/04 18:08	2/19 4:08	SF	18																			<1	<8	4.5	<2	5.4	<2	14			
TCOL02	2/18/04 18:08	2/19 4:08	ST	18	1199	8.18	12.8	16.6	189	882	7.7	4.4	0.078	1.3	1.63	0.105	440	38	207	<5	<5	380	1.8	15	23	5.4	19	<2	72			272
TCOL02	2/20/04 10:08	2/22 2:08	SF	21																			<1	<8	4.4	<2	6	<2	19			
TCOL02	2/20/04 10:08	2/22 2:08	ST	21	474	8.22	13.1	13.6	29	1540	8.3	3.3	<0.05	0.53	0.46	0.075	48	<10	50.9	<5	<5	66.9	<1	<8	7	<2	7.1	<2	19			510
TCOL02	2/22/04 4:08	2/22 14:08	SF	6																			<1	<8	7.4	<2	4.4	<2	95			
TCOL02	2/22/04 4:08	2/22 14:08	ST	6	1044	8.2	13.3	12.5	361	720	7.9	4.4	0.071	1.6	2.58	0.173	990	72	71.9	<5	<5	74.3	2.3	17	29	7.2	21	2	93			264
TCOL02	2/3/04 0:58	2/3 8:58	SF	5																			<1	<8	3.5	<2	<4	<2	<10			
TCOL02	2/3/04 0:58	2/3 8:58	ST	5					168	858	7.9	4.4	0.075	1.4	1.29	0.113	290	31	118	<5	<5	91.9	1.7	9.6	18	4.6	14	<2	64			282
TCOL02	2/4/04 10:20		D		1155	8.1	14.6	14.6																								
TCOL02	2/4/04 10:58	2/5 14:58	SF	15																			<1	<8	2.9	<2	4.2	<2	<10			
TCOL02	2/4/04 10:58	2/5 14:58	ST	15	1528	8.1	11.2	17.9	11	1410	8.3	3.7	<0.05	0.56	0.338	0.074	13	<10	47.2	<5	<5	<5	<1	<8	3.8	<2	4.2	<2	<10			430
TCOL02	2/5/04 16:58	2/6 20:58	SF	15																			<1	<8	3.7	<2	4.4	<2	<10			
TCOL02	2/5/04 16:58	2/6 20:58	ST	15	1652	8.35	9.5	12.4	1.9	1580	8.2	2.8	<0.05	0.52	0.246	0.062	<10	<10	42.9	<5	<5	<5	<1	<8	4.3	<2	4.1	<2	<10			524
TCOL02	2/7/04 0:00		DF																				<1	<8	3.7	<2	4.4	<2	<10			

Attachment C-11-III

Time-Weighted Event Mean Concentrations of Dissolved Metals for Sampled Storms 2003-2004

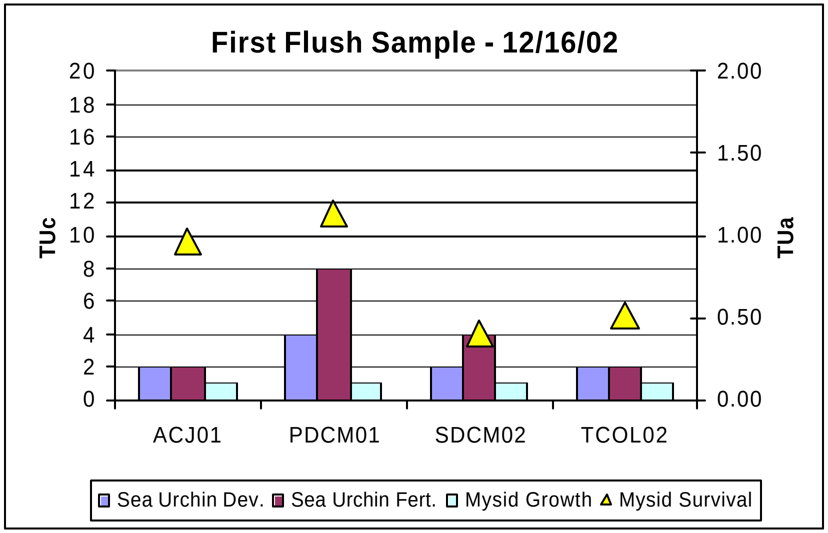
Time-Weighted Event Mean Concentrations for Dissolved Metals for Sampled Storms 2003-2004

Station	Period	Weather	Sample Length	Cd	Cr	Cu	Ni	Pb	Zn
			Days			µg/L			
ACJ01	Nov 1-5, 2003	Storm	4.3	0.6	<8	**9.6s**	**31.7s**	<2	20.4
	Feb 18-24, 2004	Storm	5.7	0.0	<8	**6.4s**	**18.0s**	<2	45.8
LCWI02	Feb 2-7, 2004	Storm	4.5	<1	<8	**5.8s**	0.0	<2	16.7
PDCM01	Nov 1-3, 2003	Storm	4.2	**10.8fs**	<8	**6.2s**	**87.1s**	<2	41.7
	Feb 2-7, 2004	Storm	4.1	**13.4fs**	<8	**8.9s**	**103.6s**	<2	66.0
	Feb 18-22, 2004	Storm	4.0	**9.0f**	<8	**10.9s**	**77.2s**	<2	62.3
SDCM02	Feb 20-22, 2004	Storm	2.0	5.7	<8	**8.7s**	**249.5fs**	<2	**93.3s**
SJNL01	Nov 12-15, 2003	Storm	3.3	<1	<8	0.8	1.0	<2	8.0
	Feb 2-6, 2004	Storm	3.8	<1	<8	**5.1s**	<4	<2	3.9
	Feb 18-22, 2004	Storm	4.0	<1	<8	**7.5s**	<4	<2	56.4
TCOL02	Nov 12-15, 2003	Storm	3.0	<1	<8	**5.1s**	5.7	<2	6.2
Saltwater CTR Chronic Criterion				9.3	50.0	3.1	8.2	8.1	81.0
Freshwater CTR Chronic Criterion @ 400 mg/L Hardness				6.3		29.3	168.0	10.9	382.4

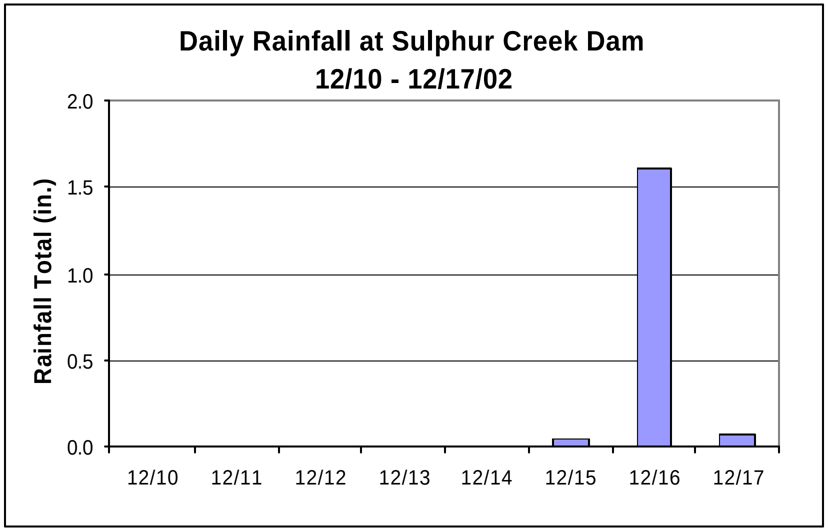
Values exceeding freshwater chronic CTR limit in bold with f appended
Values exceeding saltwater chronic CTR limit in bold with s appended

Attachment C-11-IV

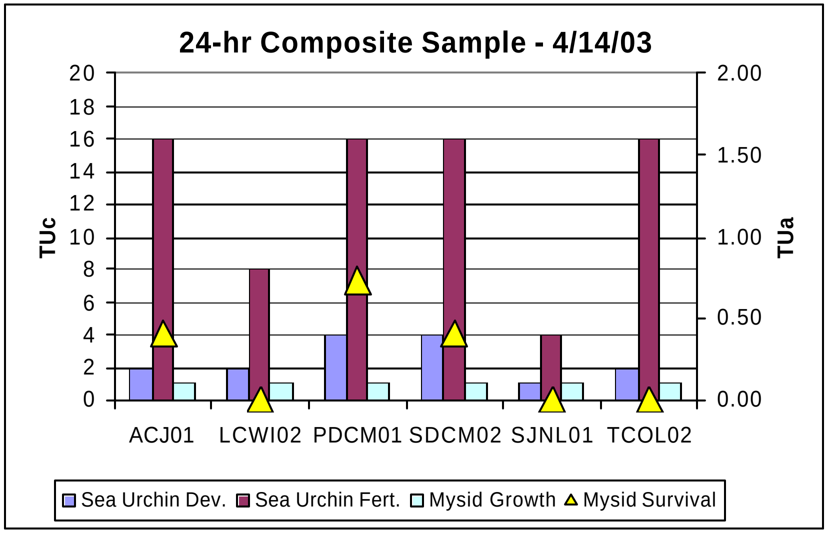
Comparison of Storm Toxicity Samples to Antecedent Rainfall



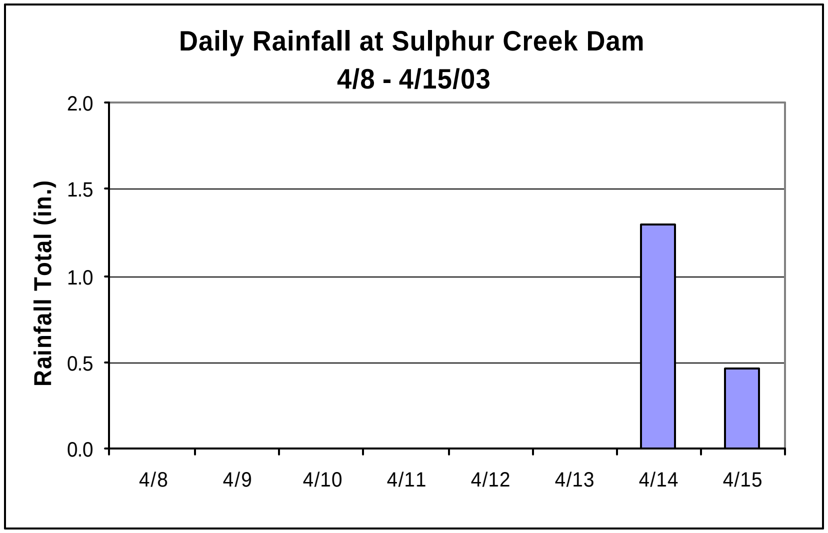
First Flush Sample - 12/16/02
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
PDCM01
SDCM02
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival



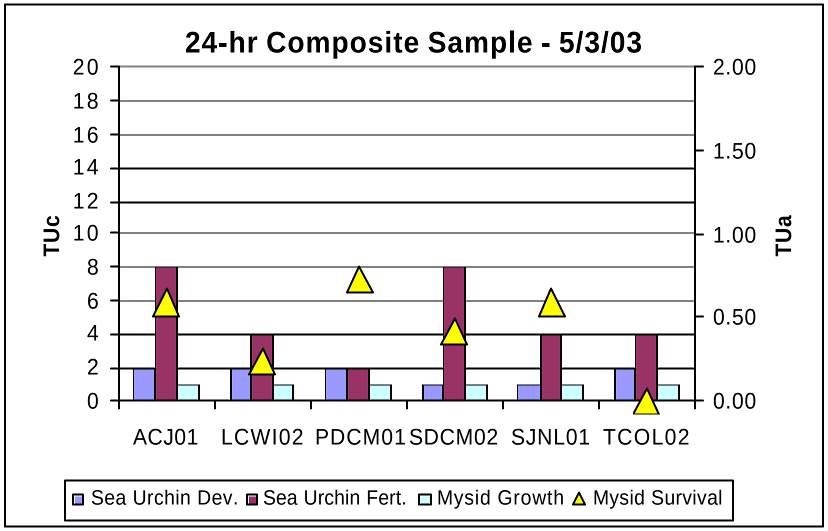
Daily Rainfall at Sulphur Creek Dam
12/10 - 12/17/02
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
12/10
12/11
12/12
12/13
12/14
12/15
12/16
12/17

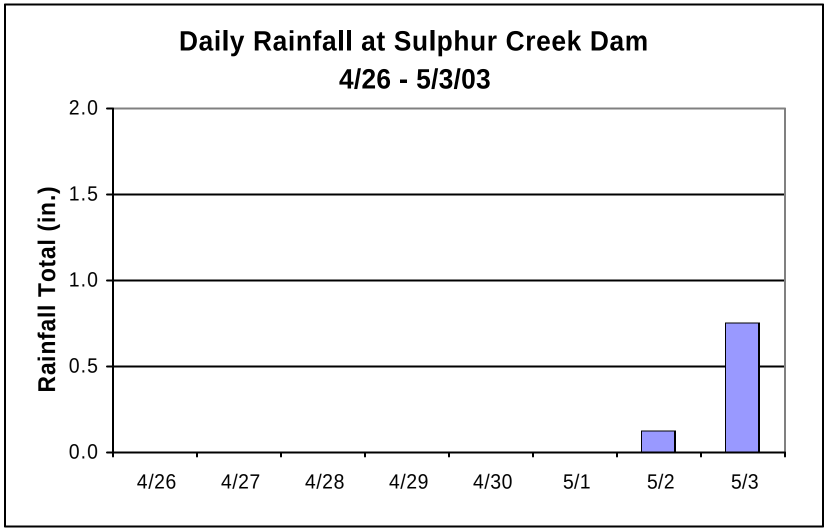


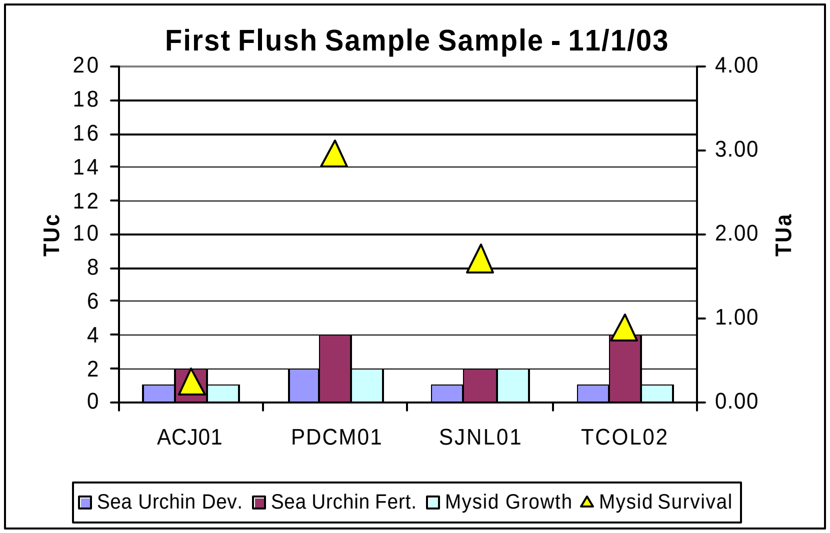
24-hr Composite Sample - 4/14/03
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
LCWI02
PDCM01
SDCM02
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival

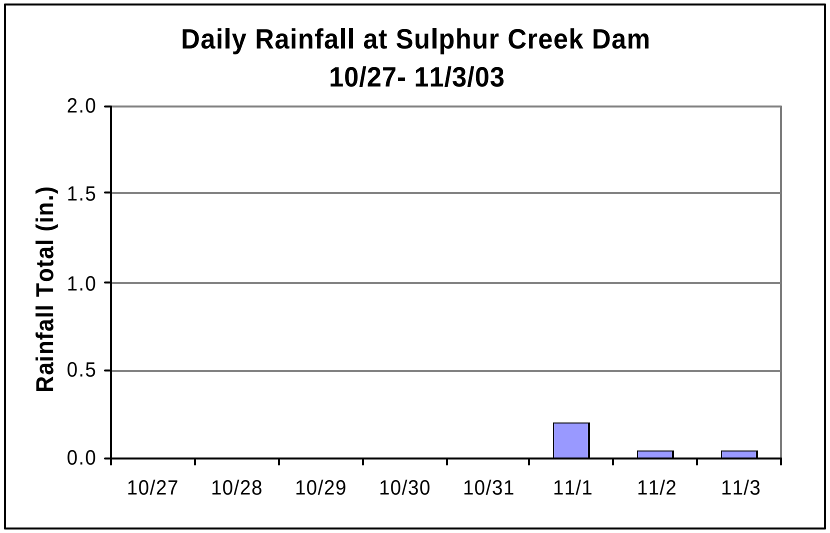


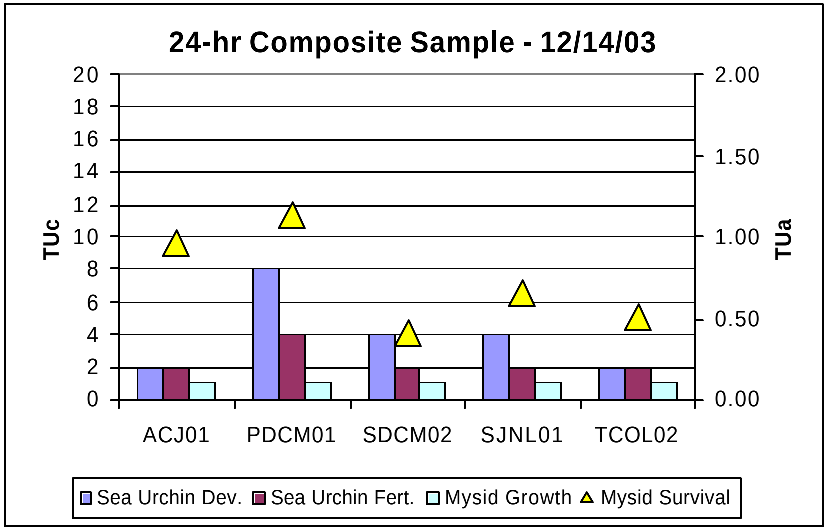
Daily Rainfall at Sulphur Creek Dam
4/8 - 4/15/03
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
4/8
4/9
4/10
4/11
4/12
4/13
4/14
4/15


24-hr Composite Sample - 5/3/03
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
LCWI02
PDCM01
SDCM02
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival

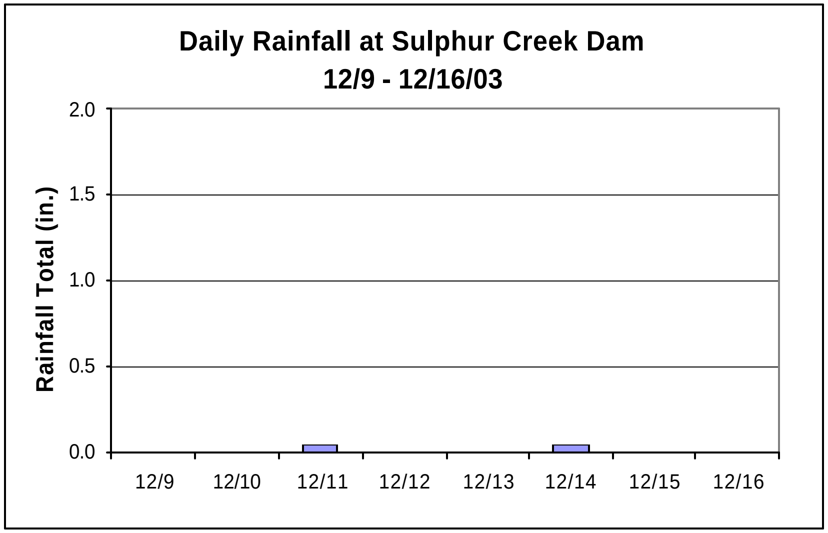

Daily Rainfall at Sulphur Creek Dam
4/26 - 5/3/03
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
4/26
4/27
4/28
4/29
4/30
5/1
5/2
5/3


First Flush Sample Sample - 11/1/03
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
4.00
3.00
2.00
1.00
0.00
ACJ01
PDCM01
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival

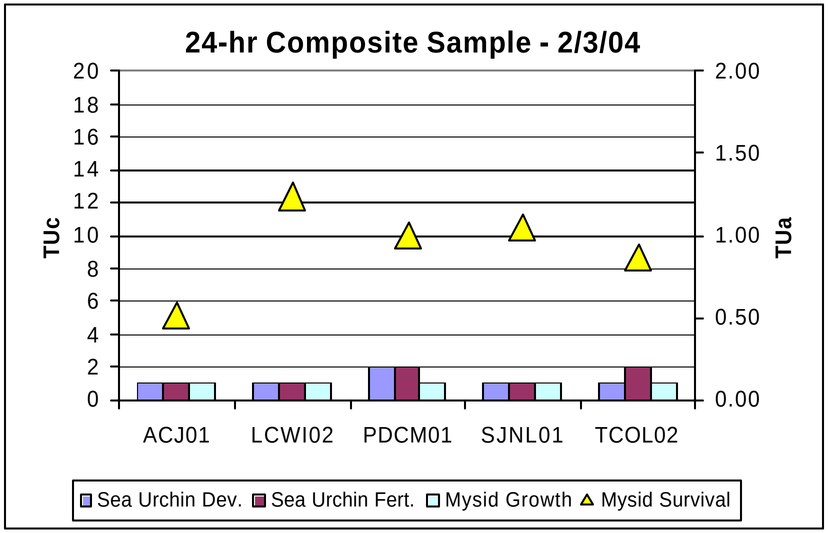

Daily Rainfall at Sulphur Creek Dam
10/27- 11/3/03
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
10/27
10/28
10/29
10/30
10/31
11/1
11/2
11/3



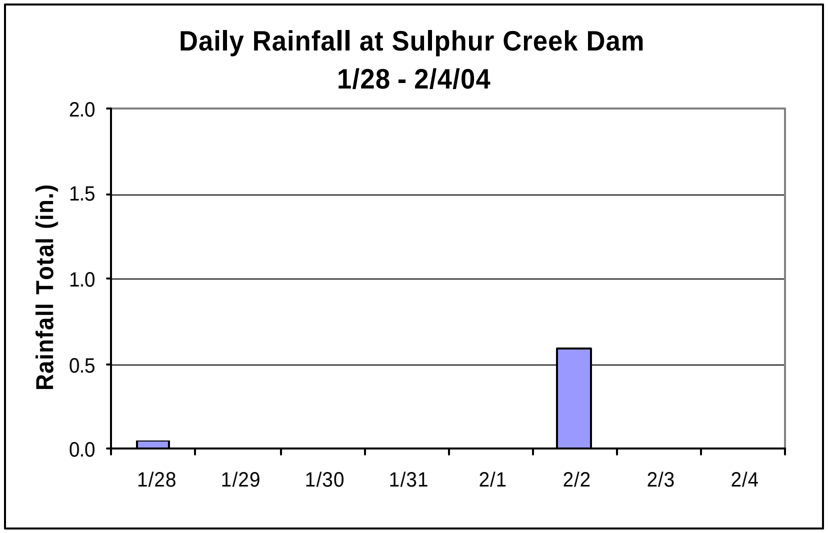
24-hr Composite Sample - 12/14/03
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
PDCM01
SDCM02
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival



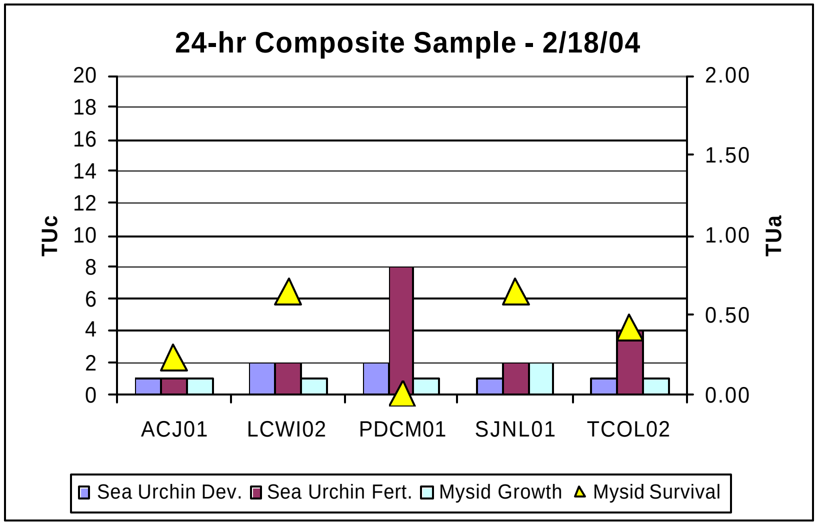
Daily Rainfall at Sulphur Creek Dam
12/9 - 12/16/03
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
12/9
12/10
12/11
12/12
12/13
12/14
12/15
12/16

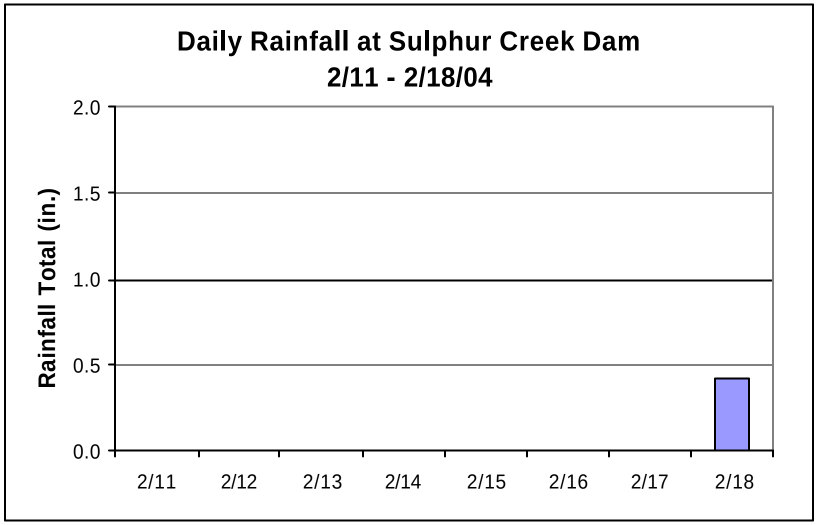


24-hr Composite Sample - 2/3/04
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
LCWI02
PDCM01
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival



Daily Rainfall at Sulphur Creek Dam
1/28 - 2/4/04
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
1/28
1/29
1/30
1/31
2/1
2/2
2/3
2/4


24-hr Composite Sample - 2/18/04
TUc
TUa
20
18
16
14
12
10
8
6
4
2
0
2.00
1.50
1.00
0.50
0.00
ACJ01
LCWI02
PDCM01
SJNL01
TCOL02
Sea Urchin Dev.
Sea Urchin Fert.
Mysid Growth
Mysid Survival


Daily Rainfall at Sulphur Creek Dam
2/11 - 2/18/04
Rainfall Total (in.)
2.0
1.5
1.0
0.5
0.0
2/11
2/12
2/13
2/14
2/15
2/16
2/17
2/18

Attachment C-11-V

Coastal Stormdrain Outfall Monitoring Data

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
ACM1	J01	7/3/03	10:05		40	<10	<10	<10	<10	<10	<10	<10	<10
ACM1	J01	7/10/03	10:17		70	<10	80	<10	<10	<10	10	<10	<10
ACM1	J01	7/17/03	9:54		<10	<10	<10	<10	<10	<10	<10	<10	<10
ACM1	J01	7/25/03	11:02		10	<10	30	190	20	30	<10	<10	<10
ACM1	J01	7/31/03	9:48	7/30	30000	10000	8000	92000	31000	553	1260	150	10
ACM1	J01	8/7/03	9:53		<10	<10	<10	490	250	<10	<10	<10	<10
ACM1	J01	8/14/03	11:23		20	<10	<10	390	130	280	60	<10	30
ACM1	J01	8/18/03	10:39		<10	<10	<10	2700	1600	3800	10	<10	<10
ACM1	J01	8/28/03	8:53		30	<10	10	3500	2050	430	220	60	30
ACM1	J01	9/5/03	10:27		180	20	80	4600	1660	3000	<10	<10	<10
ACM1	J01	9/11/03	9:42		160	90	20	ns	ns	ns	10	<10	<10
ACM1	J01	9/15/03	12:37		<10	<10	20	3200	220	350	70	<10	<10
ACM1	J01	9/25/03	9:37		10	<10	<10	ns	ns	ns	20	<10	<10
ACM1	J01	10/2/03	11:30		10	<10	<10	5300	2600	6200	20	<10	<10
ACM1	J01	10/8/03	11:05		80	20	130	8600	1160	9700	<10	<10	10
ACM1	J01	10/16/03	12:08		50	10	10	2900	1950	3050	<10	<10	<10
ACM1	J01	10/22/03	9:58		9	<9	<9	≥ 2200	120	40	9	<9	<9
ACM1	J01	10/27/03	10:39		40	30	20	≥2500	550	360	50	9	40
ACM1	J01	11/10/03	11:54	10/31-11/3	<9	<9	<9	> 2600	330	30	<9	<9	<9
ACM1	J01	11/17/03	10:55	11/12, 11/16	360	40	20	50000	3400	850	160	9	<9
ACM1	J01	12/3/03	11:06		20	<9	<9	≥ 410	60	20	9	<9	<9
ACM1	J01	12/8/03	10:25	12/7	9	9	<9	210000	6600	7900	71000	2800	4000
ACM1	J01	12/15/03	10:39	12/14	<9	<9	<9	3100	90	60	150	9	9
ACM1	J01	12/22/03	9:56		<9	<9	<9	≥ 470	9	40	<9	<9	<9
ACM1	J01	12/29/03	10:16	12/25	360	40	40	2900	340	400	340	9	40
ACM1	J01	1/6/04	10:05	Jan. 2-3	210	20	9	2,800	60	170	40	9	9
ACM1	J01	1/12/04	10:10		9	<9	9	≥ 1,010	260	110	80	50	30
ACM1	J01	1/20/04	10:30		9	<9	<9	3,100	250	130	<9	9	9
ACM1	J01	1/26/04	10:05		320	130	9	2,100	530	90	330	40	9
ACM1	J01	2/2/04	11:25		ns	ns	ns	4,000	110	90	620	99	20
ACM1	J01	2/11/04	11:15	Feb. 2-3	60	40	<9	≥ 720	30	20	40	50	<9
ACM1	J01	2/17/04	10:57		9	<9	9	≥ 500	30	20	9	<9	<9
ACM1	J01	3/4/04	9:15	Feb. 18-26, Mar. 1-3	≥ 250	110	170	≥1,800	1,100	910	170	<9	50
ACM1	J01	3/8/04	11:12		40	<9	20	200	99	40	9	<9	<9
ACM1	J01	3/18/04	10:25		20	<9	20	300	99	40	<9	9	20
ACM1	J01	3/22/04	11:18		20	<9	<9	≥ 150	250	40	9	9	9
ACM1	J01	4/1/04	10:12		<9	<9	<9	≥ 40	210	9	<9	<9	<9
ACM1	J01	4/5/04	9:00	Apr. 1-2	100	<9	9	≥ 3,000	560	450	70	<9	<9
ACM1	J01	4/12/04	10:03		140	30	<9	≥300	90	70	90	40	<9
ACM1	J01	4/19/04	10:05	Apr. 17	520	30	<9	≥4,200	590	190	1,200	99	20
ACM1	J01	4/27/04	10:15		40	<9	<9	≥ 170	260	40	40	<9	<9
ACM1	J01	5/3/04	8:32		50	30	9	≥ 80	220	40	30	40	<9
ACM1	J01	5/11/04	9:45		<9	<9	<9	≥ 300	450	90	20	<9	<9
ACM1	J01	5/17/04	9:42		110	30	30	≥ 200	200	80	≥ 580	120	140
ACM1	J01	5/24/04	10:00		200	<9	9	1,500	40	80	<9	<9	<9
ACM1	J01	6/1/04	8:52		20	9	9	≥ 200	610	320	20	9	9
ACM1	J01	6/7/04	10:10		≥ 810	190	220	2,000	410	150	130	30	20
ACM1	J01	6/14/04	10:12		9	<9	<9	300	99	20	30	30	<9
ACM1	J01	6/22/04	9:48		150	20	<9	≥ 1,000	420	130	140	9	<9
ACM1	J01	6/28/04	9:45		30	9	9	≥ 30	160	40	50	20	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
BLUBRD	IOOP03	7/3/03	9:05		ns	ns	ns	ns	ns	ns	<10	<10	<10
BLUBRD	IOOP03	7/10/03	9:29		<10	<10	<10	73000	22000	23000	<10	<10	20
BLUBRD	IOOP03	7/17/03	9:01		<10	<10	<10	17400	11900	2450	<10	<10	<10
BLUBRD	IOOP03	7/25/03	10:03		<10	<10	<10	17000	5400	3110	<10	<10	<10
BLUBRD	IOOP03	7/31/03	9:08	7/30	10	<10	<10	68000	21000	18000	<10	<10	<10
BLUBRD	IOOP03	8/7/03	8:55		10	<10	30	6000	4100	1000	<10	<10	30
BLUBRD	IOOP03	8/14/03	9:15		<10	<10	<10	33000	2400	2200	<10	<10	<10
BLUBRD	IOOP03	8/18/03	9:36		<10	<10	<10	7600	5700	8200	<10	<10	<10
BLUBRD	IOOP03	8/28/03	8:02		ns	ns	ns	ns	ns	ns	10	<10	10
BLUBRD	IOOP03	9/5/03	9:30		<10	<10	<10	ns	ns	ns	<10	<10	<10
BLUBRD	IOOP03	9/11/03	8:49		<10	<10	<10	10900	2300	780	<10	<10	<10
BLUBRD	IOOP03	9/15/03	11:35		<10	<10	<10	29000	14900	18200	30	<10	90
BLUBRD	IOOP03	9/25/03	8:40		<10	<10	<10	86000	28000	2300	<10	<10	<10
BLUBRD	IOOP03	10/2/03	10:35		<10	<10	10	30000	4100	32000	<10	<10	<10
BLUBRD	IOOP03	10/8/03	10:14		<10	<10	<10	9600	3300	7800	<10	<10	10
BLUBRD	IOOP03	10/16/03	10:56		<10	<10	<10	ns	ns	ns	<10	<10	<10
BLUBRD	IOOP03	10/22/03	9:10		ns	ns	ns	ns	ns	ns	30	9	<9
BLUBRD	IOOP03	10/27/03	9:51		560	50	70	29000	2200	2500	1400	110	40
BLUBRD	IOOP03	11/10/03	10:51	10/31-11/3	130	40	160	10000	1500	1440	40	40	40
BLUBRD	IOOP03	11/17/03	10:00	11/12, 11/16	9	<9	<9	30000	1600	1160	<9	<9	<9
BLUBRD	IOOP03	12/3/03	10:13		30	20	<9	≥ 3700	760	1500	30	30	<9
BLUBRD	IOOP03	12/8/03	9:29	12/7	390	30	90	41000	9000	9100	280	40	70
BLUBRD	IOOP03	12/15/03	9:39	12/14	20	9	20	20000	850	2200	20	9	9
BLUBRD	IOOP03	12/22/03	8:58		99	20	30	8000	750	240	70	30	40
BLUBRD	IOOP03	12/29/03	9:15	12/25	<9	9	<9	2200	170	390	20	9	<9
BLUBRD	IOOP03	1/6/04	9:16	Jan. 2-3	170	30	9	8,300	280	360	190	<9	<9
BLUBRD	IOOP03	1/12/04	9:15		<9	9	<9	41,000	1,900	1,200	30	<9	<9
BLUBRD	IOOP03	1/20/04	9:30		280	160	140	5,200	120	230	190	150	200
BLUBRD	IOOP03	1/26/04	9:05		<9	<9	<9	5,600	240	470	<9	<9	<9
BLUBRD	IOOP03	2/2/04	10:28		<9	9	9	2,100	460	400	<9	<9	20
BLUBRD	IOOP03	2/11/04	10:24	Feb. 2-3	<9	<9	<9	2,500	230	930	9	<9	<9
BLUBRD	IOOP03	2/17/04	9:57		99	20	60	56,000	3,200	2,000	99	60	40
BLUBRD	IOOP03	3/4/04	10:16	Feb. 18-26, Mar. 1-3	20	<9	<9	1,400	50	100	20	<9	<9
BLUBRD	IOOP03	3/8/04	10:24		9	<9	<9	2,800	210	440	<9	<9	<9
BLUBRD	IOOP03	3/18/04	9:15		40	<9	<9	2,800	630	1,280	20	<9	9
BLUBRD	IOOP03	3/22/04	10:12		40	<9	<9	2,200	130	440	20	9	<9
BLUBRD	IOOP03	4/1/04	9:05		40	9	<9	600	660	830	30	<9	9
BLUBRD	IOOP03	4/5/04	10:15	Apr. 1-2	20	<9	<9	1,700	340	470	<9	<9	<9
BLUBRD	IOOP03	4/12/04	9:03		<9	<9	<9	≥1,300	1,060	3,600	<9	<9	<9
BLUBRD	IOOP03	4/19/04	9:05	Apr. 17	9	<9	<9	3,600	2,600	860	<9	<9	<9
BLUBRD	IOOP03	4/27/04	9:05		<9	<9	<9	5,900,000	4,400	8,500	20	<9	<9
BLUBRD	IOOP03	5/3/04	9:50		ns	ns	ns	ns	ns	ns	<9	<9	<9
BLUBRD	IOOP03	5/11/04	8:50		ns	ns	ns	ns	ns	ns	9	<9	<9
BLUBRD	IOOP03	5/17/04	8:42		ns	ns	ns	ns	ns	ns	9	<9	<9
BLUBRD	IOOP03	5/24/04	8:56		ns	ns	ns	ns	ns	ns	<9	<9	<9
BLUBRD	IOOP03	6/1/04	10:05		ns	ns	ns	ns	ns	ns	<9	<9	<9
BLUBRD	IOOP03	6/7/04	9:03		<9	<9	<9	11,000	820	300	<9	<9	<9
BLUBRD	IOOP03	6/14/04	9:05		9	<9	<9	33,000	900	2,200	<9	<9	<9
BLUBRD	IOOP03	6/22/04	8:44		<9	<9	<9	28,000	580	≥ 2,500	9	<9	<9
BLUBRD	IOOP03	6/28/04	8:42		40	<9	<9	10,000	210	260	<9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
BLULGN		7/3/03	9:34		<10	<10	<10	760	210	510	<10	<10	<10
BLULGN		7/10/03	10:00		<10	<10	<10	2800	1100	6400	<10	<10	<10
BLULGN		7/17/03	9:35		<10	<10	<10	10300	2450	1750	<10	<10	<10
BLULGN		7/25/03	10:34		<10	<10	<10	4780	1520	3410	<10	<10	<10
BLULGN		7/31/03	9:38	7/30	20	<10	<10	4880	1720	933	20	<10	<10
BLULGN		8/7/03	9:24		<10	<10	<10	81000	14300	610	<10	<10	<10
BLULGN		8/14/03	11:06		10	<10	10	3700	900	3000	ns-hs	ns-hs	ns-hs
BLULGN		8/18/03	10:17		<10	<10	<10	3200	1700	4200	<10	<10	<10
BLULGN		8/28/03	8:34		<10	<10	<10	<10	<10	<10	90	20	660
BLULGN		9/5/03	10:05		<10	<10	<10	5000	2800	3100	<10	<10	<10
BLULGN		9/11/03	9:23		<10	<10	<10	2200	610	180	<10	<10	<10
BLULGN		9/15/03	12:16		10	<10	10	6900	2100	3400	<10	<10	<10
BLULGN		9/25/03	9:19		<10	<10	<10	4700	4100	240	<10	<10	<10
BLULGN		10/2/03	11:07		<10	<10	<10	74000	7600	9300	20	<10	10
BLULGN		10/8/03	10:46		<10	<10	<10	ns	ns	ns	<10	<10	<10
BLULGN		10/16/03	11:39		<10	<10	<10	49000	31000	43000	<10	<10	<10
BLULGN		10/22/03	9:40		40	<9	<9	≥ 23000	660	1450	20	<9	<9
BLULGN		10/27/03	10:22		9	<9	9	ns	ns	ns	30	9	<9
BLULGN		11/10/03	11:33	10/31-11/3	140	<9	9	200000	910	7400	120	<9	9
BLULGN		11/17/03	10:31	11/12, 11/16	<9	<9	<9	ns	ns	ns	9	<9	<9
BLULGN		12/3/03	10:47		<9	<9	<9	≥ 80000	9910	7300	<9	<9	<9
BLULGN		12/8/03	10:02	12/7	<9	<9	<9	≥ 69000	1400	3400	20	9	<9
BLULGN		12/15/03	10:15	12/14	9	9	<9	≥ 9000	110	1320	9	<9	<9
BLULGN		12/22/03	9:36		ns	ns	ns	ns	ns	ns	20	<9	9
BLULGN		12/29/03	9:49	12/25	<9	<9	<9	≥ 650	9	30	<9	<9	<9
BLULGN		1/6/04	9:45	Jan. 2-3	<9	<9	<9	≥ 5000	90	90	<9	<9	<9
BLULGN		1/12/04	9:50		20	<9	9	5,400	<9	170	<9	<9	<9
BLULGN		1/20/04	10:02		9	9	20	27,000	90	200	20	9	40
BLULGN		1/26/04	9:40		ns	ns	ns	ns	ns	ns	40	<9	<9
BLULGN		2/2/04	11:04		9	9	<9	≥760	20	50	9	<9	<9
BLULGN		2/11/04	11:03	Feb. 2-3	<9	<9	<9	≥ 4900	120	390	<9	<9	<9
BLULGN		2/17/04	10:36		ns	ns	ns	ns	ns	ns	<9	<9	<9
BLULGN		3/4/04	9:36	Feb. 18-26, Mar. 1-3	9	<9	<9	≥ 500	140	450	20	<9	<9
BLULGN		3/8/04	10:55		<9	<9	<9	6,200	30	360	<9	<9	<9
BLULGN		3/18/04	9:57		20	<9	<9	17,000	20	470	9	<9	<9
BLULGN		3/22/04	10:52		9	<9	<9	6,200	9	210	9	<9	<9
BLULGN		4/1/04	9:50		230	310	360	3,000	420	410	140	250	450
BLULGN		4/5/04	9:30	Apr. 1-2	ns	ns	ns	ns	ns	ns	9	9	<9
BLULGN		4/12/04	9:40		ns	ns	ns	ns	ns	ns	<9	<9	<9
BLULGN		4/19/04	9:50	Apr. 17	30	<9	<9	4,000	30	110	<9	<9	<9
BLULGN		4/27/04	9:55		<9	<9	<9	2,400	80	260	ns	ns	ns
BLULGN		5/3/04	9:00		40	9	<9	ns-hs	ns-hs	ns-hs	ns-hs	ns-hs	ns-hs
BLULGN		5/11/04	9:25		110	20	40	≥ 56,000	23,000	710	<9	<9	<9
BLULGN		5/17/04	9:16		<9	<9	<9	47,000	9,900	5,200	50	<9	<9
BLULGN		5/24/04	9:40		<9	<9	<9	≥ 31,000	450	490	<9	<9	<9
BLULGN		6/1/04	9:20		40	<9	9	78,000	3,400	11,400	50	<9	<9
BLULGN		6/7/04	9:48		<9	9	<9	32,000	1,400	2,100	50	<9	<9
BLULGN		6/14/04	9:50		<9	<9	9	≥ 118,000	500	4,700	ns-hs	ns-hs	ns-hs
BLULGN		6/22/04	9:26		<9	9	<9	≥ 670,000	2,800	2,600	<9	<9	<9
BLULGN		6/28/04	9:26		80	<9	9	≥ 1,730,000	2,300	3,300	290	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
CLEO	IOOP02	7/3/03	8:50		10	<10	<10	8550	4600	2800	<10	<10	<10
CLEO	IOOP02	7/10/03	9:10		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	7/17/03	8:36		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	7/25/03	9:49		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	7/31/03	8:40	7/30	30	<10	20	356000	95000	5000	40	<10	29
CLEO	IOOP02	8/7/03	8:31		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	8/14/03	9:05		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	8/18/03	9:17		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	8/28/03	7:53		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	9/5/03	9:20		ns	ns	ns	ns	ns	ns	60	<10	30
CLEO	IOOP02	9/11/03	8:28		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	9/15/03	11:24		ns	ns	ns	ns	ns	ns	<10	<10	90
CLEO	IOOP02	9/25/03	8:29		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	10/2/03	10:25		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	10/8/03	10:04		ns	ns	ns	ns	ns	ns	330	120	210
CLEO	IOOP02	10/16/03	10:46		ns	ns	ns	ns	ns	ns	<10	<10	<10
CLEO	IOOP02	10/22/03	8:56		ns	ns	ns	ns	ns	ns	30	<9	9
CLEO	IOOP02	10/27/03	9:41		ns	ns	ns	ns	ns	ns	140	100	60
CLEO	IOOP02	11/10/03	10:37	10/31-11/3	140	<9	9	≥ 43000	900	3600	80	<9	20
CLEO	IOOP02	11/17/03	9:45	11/12, 11/16	20	<9	<9	≥49000	2800	2400	9	<9	<9
CLEO	IOOP02	12/3/03	9:48		90	60	<9	37000	9700	4000	60	40	20
CLEO	IOOP02	12/8/03	9:07	12/7	2100	70	120	≥ 32000	2200	6800	≥ 1190	50	1250
CLEO	IOOP02	12/15/03	9:27	12/14	20	9	9	25000	660	5000	110	40	<9
CLEO	IOOP02	12/22/03	8:45		≥ 910	270	170	ns-hs	ns-hs	ns-hs	ns-hs	ns-hs	ns-hs
CLEO	IOOP02	12/29/03	8:59	12/25	20	9	<9	≥ 4400	390	850	40	9	9
CLEO	IOOP02	1/6/04	8:37	Jan. 2-3	20	<9	<9	≥ 6,000	500	1,000	30	9	20
CLEO	IOOP02	1/12/04	8:55		20	<9	9	> 2,100	180	940	<9	<9	<9
CLEO	IOOP02	1/20/04	8:50		60	9	30	4,200	110	460	70	20	9
CLEO	IOOP02	1/26/04	8:46		50	20	<9	≥ 5,500	840	1,330	240	20	9
CLEO	IOOP02	2/2/04	10:10		20	<9	9	≥4,500	580	2,700	9	9	<9
CLEO	IOOP02	2/11/04	10:08	Feb. 2-3	<9	<9	<9	5,300	4,100	330	9	9	<9
CLEO	IOOP02	2/17/04	9:38		20	<9	9	10,900	390	620	20	<9	<9
CLEO	IOOP02	3/4/04	10:35	Feb. 18-26, Mar. 1-3	30	<9	<9	≥3,000	270	510	40	<9	20
CLEO	IOOP02	3/8/04	10:15		ns	ns	ns	ns	ns	ns	50	<9	20
CLEO	IOOP02	3/18/04	9:00		ns	ns	ns	ns	ns	ns	30	9	40
CLEO	IOOP02	3/22/04	9:59		ns	ns	ns	ns	ns	ns	20	9	<9
CLEO	IOOP02	4/1/04	8:55		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	4/5/04	10:34	Apr. 1-2	ns	ns	ns	ns	ns	ns	70	<9	<9
CLEO	IOOP02	4/12/04	8:50		ns	ns	ns	ns	ns	ns	9	9	<9
CLEO	IOOP02	4/19/04	8:55	Apr. 17	ns	ns	ns	ns	ns	ns	9	<9	<9
CLEO	IOOP02	4/27/04	8:55		ns	ns	ns	ns	ns	ns	9	<9	9
CLEO	IOOP02	5/3/04	10:04		ns	ns	ns	ns	ns	ns	9	9	9
CLEO	IOOP02	5/11/04	8:40		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	5/17/04	8:30		ns	ns	ns	ns	ns	ns	30	9	<9
CLEO	IOOP02	5/24/04	8:45		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	6/1/04	10:15		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	6/7/04	8:49		ns	ns	ns	ns	ns	ns	9	<9	<9
CLEO	IOOP02	6/14/04	8:51		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	6/22/04	8:33		ns	ns	ns	ns	ns	ns	<9	<9	<9
CLEO	IOOP02	6/28/04	8:32		ns	ns	ns	ns	ns	ns	9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
CSBBR1	MOOP05	7/2/03	7:58		<10	<10	<10	21000	14000	13600	<10	<10	<10
CSBBR1	MOOP05	7/9/03	8:37		10	<10	<10	18200	4100	2090	140	30	20
CSBBR1	MOOP05	7/16/03	11:40		<10	<10	<10	3000	1000	2230	<10	<10	<10
CSBBR1	MOOP05	7/24/03	10:13		<10	<10	<10	8300	4100	2070	<10	<10	<10
CSBBR1	MOOP05	7/30/03	8:18	7/30	70	<10	10	12000	3000	40	72000	7000	10
CSBBR1	MOOP05	8/6/03	8:14		<10	<10	<10	520	170	330	<10	<10	<10
CSBBR1	MOOP05	8/13/03	8:12		80	<10	<10	27000	5800	2400	<10	<10	10
CSBBR1	MOOP05	8/20/03	9:15		10	<10	10	20	10	<10	<10	<10	<10
CSBBR1	MOOP05	8/25/03	9:48		20	<10	30	1310	360	1420	<10	<10	<10
CSBBR1	MOOP05	9/3/03	8:16		20	<10	10	2800	1090	4300	20	<10	<10
CSBBR1	MOOP05	9/8/03	9:34		<10	<10	10	530	410	1340	10	<10	20
CSBBR1	MOOP05	9/19/03	9:16		<10	<10	<10	24000	3300	3900	<10	<10	<10
CSBBR1	MOOP05	9/22/03	9:46		10	<10	10	3900	2700	3900	10	<10	<10
CSBBR1	MOOP05	10/1/03	10:08		<10	<10	<10	11600	5100	2100	<10	<10	<10
CSBBR1	MOOP05	10/7/03	9:50		<10	<10	10	11500	5600	300	<10	<10	<10
CSBBR1	MOOP05	10/15/03	9:46		10	<10	<10	1360	810	960	180	10	10
CSBBR1	MOOP05	10/23/03	8:00		9	<9	<9	≥ 3000	1400	940	30	9	<9
CSBBR1	MOOP05	10/30/03	8:19		≥ 40	<9	9	≥ 1000	1600	3700	40	<9	<9
CSBBR1	MOOP05	11/13/03	12:03	10/31-11/3	230	9	50	16000	1350	4200	330	50	40
CSBBR1	MOOP05	11/20/03	7:58	11/12, 11/16	20	20	9	350000	21000	≥ 200000	9	9	9
CSBBR1	MOOP05	12/4/03	8:47		100	80	60	≥ 1500	30	930	140	40	80
CSBBR1	MOOP05	12/11/03	8:43	12/11	330	99	400	≥ 47000	740	9300	240	80	410
CSBBR1	MOOP05	12/18/03	7:59		40	20	120	≥ 300	<9	90	99	40	99
CSBBR1	MOOP05	12/23/03	8:00		70	9	70	≥ 900	60	1150	40	80	60
CSBBR1	MOOP05	12/30/03	8:33	12/25	40	20	20	> 2900	120	420	60	9	30
CSBBR1	MOOP05	1/8/04	8:42	Jan. 2-3	70	30	30	2,400	60	220	60	50	130
CSBBR1	MOOP05	1/15/04	8:27		1,260	930	740	≥ 11,400	<9	410	440	500	600
CSBBR1	MOOP05	1/22/04	9:10		270	40	230	≥ 21,000	950	550	200	40	270
CSBBR1	MOOP05	1/28/04	8:50		240	90	160	28,000	6,000	16,100	270	130	230
CSBBR1	MOOP05	2/9/04	8:49	Feb. 2-3	9	20	40	9,700	4,900	10,000	40	9	40
CSBBR1	MOOP05	2/10/04	8:42		<9	<9	30	10,100	5,500	6,400	30	<9	<9
CSBBR1	MOOP05	3/1/04	10:38	Feb. 18-26	30	<9	40	20,000	1,040	2,600	40	<9	20
CSBBR1	MOOP05	3/10/04	9:07	Mar. 1-3	140	99	190	≥ 400	280	1,040	70	20	40
CSBBR1	MOOP05	3/15/04	10:54		60	20	80	≥ 100,000	7,400	3,900	90	60	30
CSBBR1	MOOP05	3/25/04	8:30		50	9	40	≥ 700	100	1,100	200	40	380
CSBBR1	MOOP05	3/29/04	8:20		9	9	<9	≥ 5,000	480	980	20	<9	<9
CSBBR1	MOOP05	4/8/04	11:00	Apr. 1-2	40	9	20	10,000	130	290	20	9	20
CSBBR1	MOOP05	4/15/04	8:45		90	40	9	≥600	320	190	50	20	40
CSBBR1	MOOP05	4/21/04	8:45	Apr. 17	140	90	80	≥700	380	370	130	70	110
CSBBR1	MOOP05	4/29/04	8:25		<9	9	<9	≥ 5,000	23,000	5,800	9	<9	<9
CSBBR1	MOOP05	5/5/04	10:35		40	<9	100	11,000	11,500	1,300	40	<9	9
CSBBR1	MOOPO5	5/12/04	8:29		9	20	<9	3,000	5,700	4,000	<9	30	<9
CSBBR1	MOOP05	5/20/04	8:45		<9	<9	40	≥ 11,000	≥ 22,000	10,000	20	<9	9
CSBBR1	MOOP05	5/27/04	8:47		9	<9	<9	19,000	13,300	2,200	20	9	<9
CSBBR1	MOOP05	6/3/04	10:45		60	50	160	≥ 3,000	48,000	8,900	≥ 120	90	240
CSBBR1	MOOP05	6/9/04	8:19		20	30	30	5,000	6,400	1,690	110	40	30
CSBBR1	MOOP05	6/17/04	8:29		40	20	30	≥ 8,300	1,140	2,100	240	110	40
CSBBR1	MOOP05	6/23/04	8:38		9	<9	9	≥ 23,000	4,400	8,100	9	<9	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
CSBMP1	MOOP01	7/2/03	7:56		ns	ns	ns	ns	ns	ns	<10	<10	<10
CSBMP1	MOOP01	7/9/03	8:34		ns	ns	ns	ns	ns	ns	20	<10	<10
CSBMP1	MOOP01	7/16/03	11:44		ns	ns	ns	ns	ns	ns	<10	<10	<10
CSBMP1	MOOP01	7/24/03	10:09		ns	ns	ns	ns	ns	ns	60	10	20
CSBMP1	MOOP01	7/30/03	8:13	7/30	ns	ns	ns	ns	ns	ns	20	<10	20
CSBMP1	MOOP01	8/6/03	8:10		ns	ns	ns	ns	ns	ns	<10	<10	40
CSBMP1	MOOP01	8/13/03	8:04		<10	<10	<10	9800	5100	4400	<10	<10	<10
CSBMP1	MOOP01	8/20/03	9:07		<10	<10	<10	7300	910	930	<10	<10	<10
CSBMP1	MOOP01	8/25/03	9:39		<10	<10	<10	19000	2100	28000	<10	<10	30
CSBMP1	MOOP01	9/3/03	8:-5		10	<10	10	3700	660	1900	<10	<10	20
CSBMP1	MOOP01	9/8/03	9:25		20	<10	10	3800	2700	4600	30	<10	20
CSBMP1	MOOP01	9/19/03	9:08		<10	<10	<10	26000	4100	5100	10	<10	<10
CSBMP1	MOOP01	9/22/03	9:39		20	<10	<10	8200	5100	2200	10	<10	<10
CSBMP1	MOOP01	10/1/03	10:03		ns	ns	ns	ns	ns	ns	60	10	10
CSBMP1	MOOP01	10/7/03	9:38		ns	ns	ns	ns	ns	ns	<10	<10	<10
CSBMP1	MOOP01	10/15/03	9:35		<10	<10	<10	7600	2550	4900	40	<10	<10
CSBMP1	MOOP01	10/23/03	7:54		9	9	20	≥7400	520	1060	20	9	20
CSBMP1	MOOP01	10/30/03	8:14		40	20	<9	≥ 3200	1170	1490	> 30	9	<9
CSBMP1	MOOP01	11/13/03	12:07	10/31-11/3	210	60	50	≥ 38000	1200	8800	340	20	50
CSBMP1	MOOP01	11/20/03	7:51	11/12, 11/16	<9	30	9	≥ 5100	1280	690	30	<9	20
CSBMP1	MOOP01	12/4/03	8:39		470	220	160	14000	1400	4100	200	170	150
CSBMP1	MOOP01	12/11/03	8:30	12/11	≥ 330	140	830	≥ 33000	9100	4300	320	110	400
CSBMP1	MOOP01	12/18/03	7:54		50	20	70	16000	1000	860	20	20	90
CSBMP1	MOOP01	12/23/03	7:50		70	40	60	≥ 2100	440	390	60	20	70
CSBMP1	MOOP01	12/30/03	8:20	12/25	260	90	280	≥ 2500	210	760	260	220	470
CSBMP1	MOOP01	1/8/04	8:28	Jan. 2-3	350	250	140	12,000	230	620	460	300	420
CSBMP1	MOOP01	1/15/04	8:20		240	120	460	4,600	1,350	160	360	220	480
CSBMP1	MOOP01	1/22/04	8:56		70	30	40	23,000	200	320	220	70	180
CSBMP1	MOOP01	1/28/04	8:45		180	50	300	44,000	3,200	7,600	180	110	120
CSBMP1	MOOP01	2/9/04	8:40	Feb. 2-3	30	<9	40	3,200	130	580	20	40	60
CSBMP1	MOOP01	2/10/04	8:35		40	50	50	35,000	170	500	50	30	30
CSBMP1	MOOP01	3/1/04	10:47	Feb. 18-26	<9	20	30	4,000	2,900	2,100	20	9	40
CSBMP1	MOOP01	3/10/04	9:02	Mar. 1-3	40	40	40	≥ 2,700	2,000	4,700	140	130	330
CSBMP1	MOOP01	3/15/04	10:41		50	20	30	2,800	3,300	2,200	40	40	40
CSBMP1	MOOP01	3/25/04	8:20		40	20	40	1,140	770	890	50	20	60
CSBMP1	MOOP01	3/29/04	8:07		<9	<9	9	30,000	5,200	4,300	<9	9	20
CSBMP1	MOOP01	4/8/04	11:10	Apr. 1-2	<9	40	<9	8,000	60	220	9	20	9
CSBMP1	MOOP01	4/15/04	8:36		ns	ns	ns	ns	ns	ns	40	40	50
CSBMP1	MOOP01	4/21/04	8:35	Apr. 17	50	40	50	≥640	3,300	3,600	140	140	180
CSBMP1	MOOP01	4/29/04	8:20		ns	ns	ns	ns	ns	ns	610	90	620
CSBMP1	MOOP01	5/5/04	10:44		ns	ns	ns	ns	ns	ns	30	20	9
CSBMP1	MOOP01	5/12/04	8:21		ns	ns	ns	ns	ns	ns	30	20	20
CSBMP1	MOOP01	5/20/04	8:35		20	9	40	≥ 3,000	2,000	3,900	30	9	30
CSBMP1	MOOP01	5/27/04	8:30		<9	<9	9	4,000	31,000	5,500	9	<9	<9
CSBMP1	MOOP01	6/3/04	11:00		90	40	210	≥ 1,000	≥ 1,800	1,620	40	20	120
CSBMP1	MOOP01	6/9/04	8:09		9	<9	<9	2,000	1,700	1,380	9	<9	20
CSBMP1	MOOP01	6/17/04	8:16		70	9	30	≥ 52,000	5,800	8,000	30	20	<9
CSBMP1	MOOP01	6/23/04	8:30		20	<9	9	15,000	3,100	4,500	20	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
DSB1		7/2/03	7:44		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB1		7/9/03	8:24		ns	ns	ns	ns	ns	ns	<10	<10	30
DSB1		7/16/03	12:04		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB1		7/24/03	9:58		ns	ns	ns	ns	ns	ns	10	<10	<10
DSB1		7/30/03	8:03	7/30	ns	ns	ns	ns	ns	ns	140	20	30
DSB1		8/6/03	7:58		ns	ns	ns	ns	ns	ns	50	<10	20
DSB1		8/13/03	7:41		<10	<10	<10	22000	1400	3800	<10	<10	<10
DSB1		8/20/03	8:44		10	<10	<10	3600	1130	1190	10	<10	<10
DSB1		8/25/03	9:27		<10	<10	<10	12300	3700	2700	<10	<10	<10
DSB1		9/3/03	7:48		30	<10	10	89000	17000	33000	390	10	10
DSB1		9/8/03	9:11		<10	<10	10	15000	12000	11000	20	<10	50
DSB1		9/19/03	8:48		<10	<10	<10	3800	740	690	<10	<10	<10
DSB1		9/22/03	9:24		10	<10	<10	970	520	440	30	<10	<10
DSB1		10/1/03	9:47		<10	<10	<10	2600	540	440	<10	<10	<10
DSB1		10/7/03	9:22		10	<10	<10	2100	360	6700	<10	<10	<10
DSB1		10/15/03	9:22		20	<10	10	23000	560	590	<10	<10	<10
DSB1		10/23/03	7:38		50	30	210	13000	800	1000	50	<9	50
DSB1		10/30/03	7:58		40	20	<9	≥ 3800	220	590	40	<9	9
DSB1		11/13/03	12:15	10/31-11/3	170	<9	20	≥ 30000	1300	3700	240	30	30
DSB1		11/20/03	7:38	11/12, 11/16	20	<9	20	≥ 9100	860	2700	9	20	<9
DSB1		12/4/03	8:24		ns	ns	ns	ns	ns	ns	110	50	120
DSB1		12/11/03	8:15	12/11	ns	ns	ns	ns	ns	ns	400	150	490
DSB1		12/18/03	7:46		ns	ns	ns	ns	ns	ns	260	80	180
DSB1		12/23/03	7:35		ns	ns	ns	ns	ns	ns	70	9	50
DSB1		12/30/03	8:07	12/25	ns	ns	ns	ns	ns	ns	200	70	260
DSB1		1/8/04	8:15	Jan. 2-3	ns	ns	ns	ns	ns	ns	220	120	510
DSB1		1/15/04	8:08		ns	ns	ns	ns	ns	ns	550	490	940
DSB1		1/22/04	8:40		ns	ns	ns	ns	ns	ns	160	100	90
DSB1		1/28/04	8:30		80	9	70	220,000	4,700	30,000	80	<9	90
DSB1		2/9/04	8:24	Feb. 2-3	20	<9	20	80,000	310	340	9	9	<9
DSB1		2/10/04	8:18		20	20	40	≥ 33,000	200	200	<9	9	30
DSB1		3/1/04	11:20	Feb. 18-26	<9	9	9	≥ 400	110	1,170	20	<9	40
DSB1		3/10/04	8:45	Mar. 1-3	200	99	110	16,000	140	730	160	60	170
DSB1		3/15/04	10:25		50	30	40	≥ 4,200	50	1,390	50	20	40
DSB1		3/25/04	7:58		410	140	220	≥ 2100	390	1,090	210	140	70
DSB1		3/29/04	7:50		<9	<9	<9	11,000	480	1,030	9	<9	<9
DSB1		4/8/04	11:38	Apr. 1-2	<9	<9	<9	≥1,600	170	560	<9	<9	<9
DSB1		4/15/04	8:15		<9	<9	<9	≥2,200	100	880	<9	<9	<9
DSB1		4/21/04	8:20	Apr. 17	ns	ns	ns	ns	ns	ns	9	<9	9
DSB1		4/29/04	8:04		ns	ns	ns	ns	ns	ns	20	<9	30
DSB1		5/5/04	11:00		ns	ns	ns	ns	ns	ns	30	40	<9
DSB1		5/12/04	8:05		ns	ns	ns	ns	ns	ns	<9	<9	<9
DSB1		5/20/04	8:15		ns	ns	ns	ns	ns	ns	50	<9	40
DSB1		5/27/04	8:10		ns	ns	ns	ns	ns	ns	<9	<9	<9
DSB1		6/3/04	11:25		ns	ns	ns	ns	ns	ns	70	50	40
DSB1		6/9/04	7:55		ns	ns	ns	ns	ns	ns	20	30	30
DSB1		6/17/04	8:04		ns	ns	ns	ns	ns	ns	20	20	40
DSB1		6/23/04	8:18		ns	ns	ns	ns	ns	ns	30	<9	20

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
DSB4		7/2/03	7:35		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		7/9/03	8:18		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		7/16/03	11:58		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		7/24/03	9:55		ns	ns	ns	ns	ns	ns	30	<10	10
DSB4		7/30/03	7:59	7/30	ns	ns	ns	ns	ns	ns	60	<10	110
DSB4		8/6/03	7:53		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		8/13/03	7:32		ns	ns	ns	ns	ns	ns	10	<10	60
DSB4		8/20/03	8:37		ns	ns	ns	ns	ns	ns	<10	<10	10
DSB4		8/25/03	9:20		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		9/3/03	7:41		ns	ns	ns	ns	ns	ns	20	<10	20
DSB4		9/8/03	9:03		ns	ns	ns	ns	ns	ns	30	10	20
DSB4		9/19/03	8:41		ns	ns	ns	ns	ns	ns	10	<10	<10
DSB4		9/22/03	9:14		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB4		10/1/03	9:39		ns	ns	ns	ns	ns	ns	10	<10	<10
DSB4		10/7/03	9:13		ns	ns	ns	ns	ns	ns	20	<10	<10
DSB4		10/15/03	9:14		ns	ns	ns	ns	ns	ns	380	80	170
DSB4		10/23/03	7:32		ns	ns	ns	ns	ns	ns	490	350	950
DSB4		10/30/03	7:50		ns	ns	ns	ns	ns	ns	440	170	480
DSB4		11/13/03	12:51	10/31-11/3	ns	ns	ns	ns	ns	ns	140	20	40
DSB4		11/20/03	7:25	11/12, 11/16	ns	ns	ns	ns	ns	ns	250	110	180
DSB4		12/4/03	8:18		ns	ns	ns	ns	ns	ns	590	320	910
DSB4		12/11/03	8:09	12/11	ns	ns	ns	ns	ns	ns	460	250	850
DSB4		12/18/03	7:34		ns	ns	ns	ns	ns	ns	50	9	180
DSB4		12/23/03	7:29		ns	ns	ns	ns	ns	ns	1040	600	3800
DSB4		12/30/03	7:59	12/25	ns	ns	ns	ns	ns	ns	100	40	200
DSB4		1/8/04	8:05	Jan. 2-3	ns	ns	ns	ns	ns	ns	60	20	99
DSB4		1/15/04	8:02		ns	ns	ns	ns	ns	ns	100	50	300
DSB4		1/22/04	8:33		ns	ns	ns	ns	ns	ns	80	20	60
DSB4		1/28/04	8:20		ns	ns	ns	ns	ns	ns	90	40	110
DSB4		2/9/04	8:15	Feb. 2-3	ns	ns	ns	ns	ns	ns	20	<9	9
DSB4		2/10/04	8:10		ns	ns	ns	ns	ns	ns	140	99	70
DSB4		3/1/04	11:33	Feb. 18-26	ns	ns	ns	ns	ns	ns	30	20	40
DSB4		3/10/04	8:35	Mar. 1-3	ns	ns	ns	ns	ns	ns	630	470	650
DSB4		3/15/04	10:18		ns	ns	ns	ns	ns	ns	240	200	99
DSB4		3/25/04	8:48		ns	ns	ns	ns	ns	ns	770	540	630
DSB4		3/29/04	7:40		ns	ns	ns	ns	ns	ns	<9	<9	<9
DSB4		4/8/04	11:50	Apr. 1-2	ns	ns	ns	ns	ns	ns	30	<9	<9
DSB4		4/15/04	8:05		ns	ns	ns	ns	ns	ns	30	9	<9
DSB4		4/21/04	8:12	Apr. 17	ns	ns	ns	ns	ns	ns	180	130	160
DSB4		4/29/04	7:52		ns	ns	ns	ns	ns	ns	30	<9	20
DSB4		5/5/04	11:10		ns	ns	ns	ns	ns	ns	<9	9	9
DSB4		5/12/04	7:55		ns	ns	ns	ns	ns	ns	9	30	40
DSB4		5/20/04	7:55		ns	ns	ns	ns	ns	ns	9	9	60
DSB4		5/27/04	8:00		ns	ns	ns	ns	ns	ns	9	<9	20
DSB4		6/3/04	11:35		ns	ns	ns	ns	ns	ns	70	30	30
DSB4		6/9/04	7:45		ns	ns	ns	ns	ns	ns	30	40	40
DSB4		6/17/04	7:55		ns	ns	ns	ns	ns	ns	9	20	80
DSB4		6/23/04	8:16		ns	ns	ns	ns	ns	ns	80	20	60

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
DSB5		7/3/03	11:26		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		7/10/03	11:20		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		7/17/03	11:03		ns	ns	ns	ns	ns	ns	30	10	10
DSB5		7/25/03	12:07		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		7/31/03	11:01	7/30	ns	ns	ns	ns	ns	ns	245	110	<10
DSB5		8/7/03	10:57		ns	ns	ns	ns	ns	ns	20	<10	10
DSB5		8/14/03	12:34		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		8/18/03	12:22		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		8/28/03	10:20		ns	ns	ns	ns	ns	ns	10	<10	<10
DSB5		9/5/03	11:47		ns	ns	ns	ns	ns	ns	540	410	<10
DSB5		9/11/03	10:38		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		9/15/03	13:47		ns	ns	ns	ns	ns	ns	10	<10	<10
DSB5		9/25/03	10:38		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		10/2/03	12:30		ns	ns	ns	ns	ns	ns	70	10	60
DSB5		10/8/03	12:10		ns	ns	ns	ns	ns	ns	<10	<10	<10
DSB5		10/15/03	8:45		ns	ns	ns	ns	ns	ns	30	<10	<10
DSB5		10/22/03	11:04		ns	ns	ns	ns	ns	ns	9	9	20
DSB5		10/27/03	11:44		ns	ns	ns	ns	ns	ns	60	70	420
DSB5		11/10/03	12:51	10/31-11/3	150	20	140	13000	80	40	200	30	99
DSB5		11/17/03	12:07	11/12, 11/16	280	40	340	190000	22000	43000	300	30	450
DSB5		12/3/03	12:10		130	20	150	36000	540	1140	360	220	300
DSB5		12/8/03	11:35	12/7	1500	460	200	360000	21000	9300	2100	470	440
DSB5		12/15/03	11:50	12/14	70	30	80	31000	580	190	1220	1050	940
DSB5		12/22/03	10:58		210	90	570	≥ 9400	≥ 680	2300	150	40	200
DSB5		12/29/03	11:27	12/25	15000	200	200	19000	3300	61000	1100	500	740
DSB5		1/6/04	11:09	Jan. 2-3	3,000	1,160	6,200	≥ 11,300	790	110	1,140	610	1,460
DSB5		1/12/04	11:20		60	40	130	≥ 1,380	590	410	120	30	110
DSB5		1/20/04	11:43		610	280	2,400	940	800	1,060	980	450	3,300
DSB5		1/26/04	11:05		420	190	350	≥ 510,000	21,000	1,500	40	<9	70
DSB5		2/2/04	12:40		360	99	230	23,000	490	40	8,700	4,600	2,100
DSB5		2/11/04	12:48	Feb. 2-3	860	170	560	≥ 600	140	110	≥ 8,000	4,200	5,300
DSB5		2/17/04	12:05		440	130	300	2,000	170	140	320	90	140
DSB5		3/4/04	7:54	Feb. 18-26, Mar. 1-3	≥ 20,000	2,800	56,000	≥ 48,000	35,000	4,000	≥ 38,000	3,200	79,000
DSB5		3/8/04	12:10		≥ 3,000	800	2,300	38,000	37,000	14,000	≥ 910	99	1,040
DSB5		3/18/04	11:20		≥ 370	80	760	≥ 4,100	760	2,500	≥ 410	40	880
DSB5		3/22/04	12:28		≥410	180	530	1,400	20	180	150	9	410
DSB5		4/1/04	11:10		130	40	90	≥600	970	570	≥180	100	3,200
DSB5		4/5/04	7:50	Apr. 1-2	2,200	90	160	51,000	560	120	220	40	160
DSB5		4/12/04	11:15		20	<9	20	2,000	260	1,300	<9	<9	9
DSB5		4/19/04	11:24	Apr. 17	180	9	90	≥31,000	2,200	3,900	20	<9	20
DSB5		4/27/04	11:30		540	9	90	3,900	170	280	110	<9	9
DSB5		5/3/04	7:15		160	40	80	1,000	350	2,900	60	30	70
DSB5		5/11/04	10:58		99	60	90	≥ 900	≥ 180	110	60	<9	40
DSB5		5/17/04	10:53		140	210	80	6,700	<9	200	30	50	60
DSB5		5/24/04	11:08		60	20	20	9	<9	<9	≥ 30	40	40
DSB5		6/1/04	7:45		≥ 230	280	940	≥ 90	200	400	50	20	150
DSB5		6/7/04	11:16		40	20	40	600	1,800	1,250	50	30	40
DSB5		6/14/04	11:20		69,000	55,000	11,000	≥ 400	50	150	9	20	190
DSB5		6/22/04	10:55		240	40	30	≥ 600	<9	20	180	110	30
DSB5		6/28/04	10:55		<9	<9	9	≥ 300	90	1,120	40	9	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
DUMOND		7/3/03	9:26		<10	<10	<10	5400	3550	1500	<10	<10	<10
DUMOND		7/10/03	9:50		<10	<10	<10	68000	23000	14750	<10	<10	<10
DUMOND		7/17/03	9:27		10	<10	<10	<10	<10	<10	<10	<10	<10
DUMOND		7/25/03	10:26		<10	<10	<10	16200	4350	9300	<10	<10	<10
DUMOND		7/31/03	9:28	7/30	<10	<10	<10	46000	13000	3990	10	<10	<10
DUMOND		8/7/03	9:15		<10	<10	<10	2900	1000	3000	<10	<10	<10
DUMOND		8/14/03	10:55		10	<10	10	26000	5600	6100	<10	<10	<10
DUMOND		8/18/03	10:08		150	20	50	21000	16000	28000	<10	<10	<10
DUMOND		8/28/03	8:19		<10	<10	<10	2400	2300	300	<10	<10	10
DUMOND		9/5/03	9:56		<10	<10	<10	3300	2000	3100	<10	<10	<10
DUMOND		9/11/03	9:12		10	<10	<10	6600	4900	320	<10	<10	<10
DUMOND		9/15/03	12:04		<10	<10	<10	2900	620	3400	<10	<10	10
DUMOND		9/25/03	9:04		10	<10	<10	41000	7800	5300	<10	<10	<10
DUMOND		10/2/03	10:58		ns	ns	ns	ns	ns	ns	10	<10	<10
DUMOND		10/8/03	10:34		<10	<10	<10	34000	8000	39000	<10	<10	<10
DUMOND		10/16/03	11:27		10	<10	10	560	320	440	<10	<10	<10
DUMOND		10/22/03	9:33		ns	ns	ns	ns	ns	ns	20	<9	<9
DUMOND		10/27/03	10:15		50	40	210	ns	ns	ns	<9	9	20
DUMOND		11/10/03	11:22	10/31-11/3	9	<9	<9	39000	210	4500	<9	9	9
DUMOND		11/17/03	10:21	11/12, 11/16	20	<9	<9	230000	1600	6400	<9	<9	<9
DUMOND		12/3/03	10:36		9	<9	<9	≥ 7300	200	1040	<9	<9	<9
DUMOND		12/8/03	9:55	12/7	20	<9	<9	17000	1400	1700	9	<9	<9
DUMOND		12/15/03	10:02	12/14	<9	<9	<9	≥ 6400	230	1040	<9	<9	<9
DUMOND		12/22/03	9:26		40	9	9	49000	1100	530	9	9	<9
DUMOND		12/29/03	9:40	12/25	9	<9	40	> 640	60	290	9	<9	<9
DUMOND		1/6/04	9:38	Jan. 2-3	20	9	<9	≥ 1,400	110	110	210	9	20
DUMOND		1/12/04	9:40		40	<9	<9	≥ 2,800	420	4,600	40	9	9
DUMOND		1/20/04	10:00		ns	ns	ns	ns	ns	ns	<9	9	9
DUMOND		1/26/04	9:35		ns	ns	ns	ns	ns	ns	9	<9	9
DUMOND		2/2/04	10:57		<9	<9	<9	13,000	60	530	9	<9	<9
DUMOND		2/11/04	10:54	Feb. 2-3	<9	<9	9	≥ 6,200	200	300	<9	<9	<9
DUMOND		2/17/04	10:26		<9	<9	<9	≥ 5,000	140	870	<9	<9	<9
DUMOND		3/4/04	9:50	Feb. 18-26, Mar. 1-3	<9	<9	<9	≥1,600	3,700	5,500	<9	<9	<9
DUMOND		3/8/04	10:47		<9	<9	<9	≥ 1,400	280	973	<9	<9	<9
DUMOND		3/18/04	9:45		<9	<9	9	≥ 1,700	90	500	20	<9	<9
DUMOND		3/22/04	10:45		9	<9	20	≥2,700	450	2,300	9	<9	<9
DUMOND		4/1/04	9:36		<9	<9	<9	200	30	40	<9	<9	<9
DUMOND		4/5/04	9:40	Apr. 1-2	20	<9	<9	≥ 310	40	760	30	<9	<9
DUMOND		4/12/04	9:35		ns	ns	ns	ns	ns	ns	9	<9	9
DUMOND		4/19/04	9:35	Apr. 17	<9	<9	<9	≥1,000	70	40	<9	<9	<9
DUMOND		4/27/04	9:40		<9	<9	<9	≥ 2,000	1,000	730	9	<9	<9
DUMOND		5/3/04	9:05		20	<9	9	17,000	<9	9	30	<9	<9
DUMOND		5/11/04	9:15		<9	<9	<9	≥ 16,000	20,000	12,100	<9	9	<9
DUMOND		5/17/04	9:05		<9	9	<9	≥ 200	<9	50	<9	<9	<9
DUMOND		5/24/04	9:25		<9	<9	<9	2,300	80	190	<9	<9	<9
DUMOND		6/1/04	9:33		<9	<9	<9	14,000	1,700	5,400	<9	<9	<9
DUMOND		6/7/04	9:31		30	<9	<9	8,000	1,810	1,720	<9	9	<9
DUMOND		6/14/04	9:40		<9	<9	<9	≥ 9,300	500	2,400	9	<9	<9
DUMOND		6/22/04	9:14		9	<9	<9	23,000	2,900	2,200	9	<9	<9
DUMOND		6/28/04	9:11		110	<9	30	5,000	<9	340	9	<9	<9

Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
ELMORO	H04	7/3/03	7:54		<10	<10	<10	120	80	340	<10	<10	<10
ELMORO	H04	7/10/03	8:04		10	<10	<10	1650	510	2350	<10	<10	<10
ELMORO	H04	7/17/03	7:32		<10	<10	<10	565	240	280	<10	<10	<10
ELMORO	H04	7/25/03	8:55		10	<10	10	1740	290	740	<10	<10	<10
ELMORO	H04	7/31/03	7:36	7/30	30	<10	10	2600	1500	110	20	<10	<10
ELMORO	H04	8/7/03	7:36		<10	<10	<10	1100	600	700	<10	<10	<10
ELMORO	H04	8/14/03	7:58		440	30	90	3300	1700	350	<10	<10	10
ELMORO	H04	8/18/03	8:30		<10	<10	<10	6700	6500	700	<10	<10	<10
ELMORO	H04	8/28/03	6:56		<10	<10	<10	2400	2200	160	10	<10	<10
ELMORO	H04	9/5/03	8:25		<10	<10	<10	6300	2100	2800	<10	<10	<10
ELMORO	H04	9/11/03	7:20		50	<10	<10	930	240	80	80	20	<10
ELMORO	H04	9/15/03	10:33		<10	<10	30	2000	160	280	10	<10	<10
ELMORO	H04	9/25/03	7:23		<10	<10	<10	2800	460	170	<10	<10	<10
ELMORO	H04	10/2/03	9:21		20	<10	<10	1930	530	1240	<10	<10	<10
ELMORO	H04	10/8/03	9:05		<10	<10	<10	23000	1860	32000	<10	<10	20
ELMORO	H04	10/16/03	9:57		<10	<10	<10	480	210	330	<10	<10	<10
ELMORO	H04	10/22/03	7:35		<9	<9	<9	≥ 2500	220	1900	<9	<9	<9
ELMORO	H04	10/27/03	8:35		20	<9	<9	2500	470	450	20	30	20
ELMORO	H04	11/10/03	9:20	10/31-11/3	40	<9	<9	≥ 3400	390	330	30	<9	<9
ELMORO	H04	11/17/03	8:29	11/12, 11/16	20	<9	<9	3800	170	230	20	<9	<9
ELMORO	H04	12/3/03	8:26		<9	<9	<9	2700	290	510	9	<9	<9
ELMORO	H04	12/8/03	8:00	12/7	60	50	9	≥ 7100	410	1050	30	<9	9
ELMORO	H04	12/15/03	8:11	12/14	<9	<9	<9	≥ 1300	140	770	20	<9	<9
ELMORO	H04	12/22/03	7:30		230	20	<9	3200	1900	80	80	<9	<9
ELMORO	H04	12/29/03	7:44	12/25	<9	<9	<9	≥ 2000	230	570	9	<9	<9
ELMORO	H04	1/6/04	7:30	Jan. 2-3	9	<9	<9	≥ 360	30	200	20	<9	<9
ELMORO	H04	1/12/04	7:45		20	<9	<9	≥ 320	40	190	30	40	<9
ELMORO	H04	1/20/04	8:00		60	30	30	≥ 1,000	30	99	60	<9	9
ELMORO	H04	1/26/04	7:32		9	<9	<9	≥ 1,500	40	270	20	<9	<9
ELMORO	H04	2/2/04	8:56		9	<9	<9	2,800	80	440	<9	<9	<9
ELMORO	H04	2/11/04	8:47	Feb. 2-3	<9	<9	<9	≥ 500	200	330	<9	<9	<9
ELMORO	H04	2/17/04	8:26		9	<9	<9	2,200	630	920	9	9	<9
ELMORO	H04	3/4/04	11:58	Feb. 18-26, Mar. 1-3	9	<9	9	500	160	1,580	<9	<9	<9
ELMORO	H04	3/8/04	9:10		20	<9	<9	≥ 230	140	1,080	<9	<9	<9
ELMORO	H04	3/18/04	7:54		90	20	<9	1,000	180	1,470	20	<9	9
ELMORO	H04	3/22/04	8:17		<9	<9	<9	≥ 210	200	1,100	<9	<9	<9
ELMORO	H04	4/1/04	7:40		<9	<9	<9	1,000	340	860	<9	<9	9
ELMORO	H04	4/5/04	11:40	Apr. 1-2	9	<9	<9	≥ 4,600	3,300	540	<9	<9	<9
ELMORO	H04	4/12/04	7:30		<9	<9	<9	1,500	510	590	<9	<9	<9
ELMORO	H04	4/19/04	7:36	Apr. 17	200	9	<9	≥1,000	810	5,500	180	<9	<9
ELMORO	H04	4/27/04	7:45		9	<9	<9	1,000	350	1,700	<9	<9	<9
ELMORO	H04	5/3/04	11:05		100	<9	40	≥ 900	560	2,200	110	<9	40
ELMORO	H04	5/11/04	7:40		<9	<9	<9	≥ 900	840	1,590	<9	<9	<9
ELMORO	H04	5/17/04	7:40		<9	<9	<9	≥ 600	1,270	3,000	<9	<9	<9
ELMORO	H04	5/24/04	7:45		<9	<9	<9	10,000	1,140	2,500	<9	<9	<9
ELMORO	H04	6/1/04	11:10		<9	<9	<9	600	1,170	850	<9	<9	<9
ELMORO	H04	6/7/04	7:40		<9	<9	9	≥ 3,400	890	920	<9	<9	<9
ELMORO	H04	6/14/04	7:51		<9	<9	<9	≥ 10,500	260	790	9	<9	<9
ELMORO	H04	6/22/04	7:40		<9	<9	<9	5,200	470	750	<9	9	<9
ELMORO	H04	6/28/04	7:41		20	<9	<9	37,000	4,100	4,100	20	20	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
EMRLD	H05	7/3/03	8:06		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	7/10/03	8:18		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	7/17/03	7:41		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	7/25/03	9:13		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	7/31/03	7:53	7/30	30	<10	<10	13800	6550	3040	10	<10	<10
EMRLD	H05	8/7/03	7:47		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	8/14/03	8:21		ns	ns	ns	ns	ns	ns	<10	<10	10
EMRLD	H05	8/18/03	8:41		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	8/28/03	7:06		ns	ns	ns	ns	ns	ns	10	<10	10
EMRLD	H05	9/5/03	8:38		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	9/11/03	7:33		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	9/15/03	10:44		ns	ns	ns	ns	ns	ns	<10	<10	30
EMRLD	H05	9/25/03	7:43		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	10/2/03	9:34		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	10/8/03	9:21		ns	ns	ns	ns	ns	ns	10	<10	<10
EMRLD	H05	10/16/03	10:06		ns	ns	ns	ns	ns	ns	<10	<10	<10
EMRLD	H05	10/22/03	7:54		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	10/27/03	8:54		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	11/10/03	9:39	10/31-11/3	20	<9	20	≥ 62000	13700	4700	20	20	9
EMRLD	H05	11/17/03	8:48	11/12, 11/16	ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	12/3/03	8:49		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	12/8/03	8:15	12/7	50	<9	<9	≥ 53000	15000	42000	20	<9	40
EMRLD	H05	12/15/03	8:26	12/14	<9	<9	<9	≥ 35000	3300	14800	<9	<9	<9
EMRLD	H05	12/22/03	7:41		ns	ns	ns	ns	ns	ns	<9	<9	20
EMRLD	H05	12/29/03	8:02	12/25	<9	<9	<9	≥ 42000	4700	3500	9	<9	<9
EMRLD	H05	1/6/04	7:47	Jan. 2-3	ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	1/12/04	8:05		ns	ns	ns	ns	ns	ns	<9	9	<9
EMRLD	H05	1/20/04	8:19		ns	ns	ns	ns	ns	ns	<9	<9	40
EMRLD	H05	1/26/04	7:50		9	<9	<9	48,000	6,500	5,900	<9	<9	<9
EMRLD	H05	2/2/04	9:14		40	<9	<9	38,000	3,100	4,800	<9	<9	<9
EMRLD	H05	2/11/04	9:12	Feb. 2-3	<9	<9	<9	≥ 65,000	710	4,500	<9	20	<9
EMRLD	H05	2/17/04	8:45		ns	ns	ns	ns	ns	ns	9	9	<9
EMRLD	H05	3/4/04	11:45	Feb. 18-26, Mar. 1-3	ns	ns	ns	ns	ns	ns	<9	9	<9
EMRLD	H05	3/8/04	9:24		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	3/18/04	8:10		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	3/22/04	8:35		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	4/1/04	8:00		ns	ns	ns	ns	ns	ns	20	9	<9
EMRLD	H05	4/5/04	11:30	Apr. 1-2	ns	ns	ns	ns	ns	ns	9	<9	<9
EMRLD	H05	4/12/04	7:52		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	4/19/04	7:55	Apr. 17	<9	<9	<9	≥600	1,200	1,300	<9	<9	<9
EMRLD	H05	4/27/04	8:05		ns	ns	ns	ns	ns	ns	9	<9	<9
EMRLD	H05	5/3/04	10:55		ns	ns	ns	ns	ns	ns	90	<9	<9
EMRLD	H05	5/11/04	8:00		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	5/17/04	7:55		ns	ns	ns	ns	ns	ns	40	<9	<9
EMRLD	H05	5/24/04	8:04		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	6/1/04	10:57		ns	ns	ns	ns	ns	ns	<9	<9	<9
EMRLD	H05	6/7/04	8:03		9	<9	<9	190,000	35,000	101,000	<9	<9	<9
EMRLD	H05	6/14/04	8:11		ns	ns	ns	ns	ns	ns	9	<9	<9
EMRLD	H05	6/22/04	7:55		ns	ns	ns	ns	ns	ns	<9	<9	9
EMRLD	H05	6/28/04	7:50		ns	ns	ns	ns	ns	ns	<9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	FC	Ent	PIPE / STORM CHANNEL TC	FC	Ent	DOWN COAST (D/C) TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
HEISLR	IOOP01	7/3/03	8:24		<10	<10	<10	<10	<10	<10	<10	<10	<10
HEISLR	IOOP01	7/10/03	8:33		<10	<10	<10	10100	5800	9800	10	<10	<10
HEISLR	IOOP01	7/17/03	8:07		<10	<10	<10	860	410	560	<10	<10	<10
HEISLR	IOOP01	7/25/03	9:19		ns	ns	ns	ns	ns	ns	10	<10	20
HEISLR	IOOP01	7/31/03	8:05	7/30	ns	ns	ns	ns	ns	ns	160	30	<10
HEISLR	IOOP01	8/7/03	7:58		<10	<10	<10	10	<10	<10	<10	<10	<10
HEISLR	IOOP01	8/14/03	8:30		<10	<10	<10	180	10	20	<10	<10	<10
HEISLR	IOOP01	8/18/03	8:53		<10	<10	<10	ns	ns	ns	20	<10	50
HEISLR	IOOP01	8/28/03	7:19		ns	ns	ns	ns	ns	ns	<10	<10	<10
HEISLR	IOOP01	9/5/03	8:52		<10	<10	<10	<10	<10	<10	<10	<10	10
HEISLR	IOOP01	9/11/03	7:52		<10	<10	<10	4700	960	70	<10	<10	<10
HEISLR	IOOP01	9/15/03	10:56		40	10	80	730	170	810	<10	<10	<10
HEISLR	IOOP01	9/25/03	7:55		<10	<10	<10	240	50	10	<10	<10	<10
HEISLR	IOOP01	10/2/03	9:45		<10	<10	<10	460	60	510	<10	<10	<10
HEISLR	IOOP01	10/8/03	9:31		<10	<10	<10	110	20	160	<10	<10	<10
HEISLR	IOOP01	10/16/03	10:14		20	<10	10	570	360	470	<10	<10	<10
HEISLR	IOOP01	10/22/03	8:07		<9	<9	<9	≥ 1600	590	710	<9	9	<9
HEISLR	IOOP01	10/27/03	9:10		330	260	310	1200	210	1000	≥40	40	140
HEISLR	IOOP01	11/10/03	9:52	10/31-11/3	9	<9	<9	≥ 20	<9	<9	9	<9	<9
HEISLR	IOOP01	11/17/03	9:01	11/12, 11/16	40	<9	<9	≥700	<9	<9	50	9	9
HEISLR	IOOP01	12/3/03	8:59		<9	9	9	≥ 1280	<9	20	<9	<9	<9
HEISLR	IOOP01	12/8/03	8:35	12/7	20	<9	<9	≥280	9	30	<9	<9	9
HEISLR	IOOP01	12/15/03	8:45	12/14	9	<9	<9	> 50	<9	50	9	<9	<9
HEISLR	IOOP01	12/22/03	7:55		20	<9	<9	≥ 230	<9	<9	<9	20	<9
HEISLR	IOOP01	12/29/03	8:20	12/25	20	<9	<9	≥ 750	<9	110	<9	<9	<9
HEISLR	IOOP01	1/6/04	7:56	Jan. 2-3	ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	1/12/04	8:17		9	<9	<9	≥ 480	9	290	<9	<9	20
HEISLR	IOOP01	1/20/04	8:35		ns	ns	ns	ns	ns	ns	9	9	<9
HEISLR	IOOP01	1/26/04	8:10		ns	ns	ns	ns	ns	ns	20	<9	<9
HEISLR	IOOP01	2/2/04	9:31		ns	ns	ns	ns	ns	ns	20	9	440
HEISLR	IOOP01	2/11/04	9:32	Feb. 2-3	ns	ns	ns	ns	ns	ns	9	<9	<9
HEISLR	IOOP01	2/17/04	9:02		ns	ns	ns	ns	ns	ns	70	<9	9
HEISLR	IOOP01	3/4/04	11:35	Feb. 18-26, Mar. 1-3	ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	3/8/04	9:34		ns	ns	ns	ns	ns	ns	9	9	<9
HEISLR	IOOP01	3/18/04	8:25		ns	ns	ns	ns	ns	ns	20	<9	<9
HEISLR	IOOP01	3/22/04	8:49		ns	ns	ns	ns	ns	ns	20	20	9
HEISLR	IOOP01	4/1/04	8:10		<9	20	<9	<9	9	<9	<9	9	9
HEISLR	IOOP01	4/5/04	11:15	Apr. 1-2	ns	ns	ns	ns	ns	ns	40	<9	9
HEISLR	IOOP01	4/12/04	8:10		<9	<9	<9	≥30	<9	390	<9	<9	<9
HEISLR	IOOP01	4/19/04	8:20	Apr. 17	ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	4/27/04	8:20		ns	ns	ns	ns	ns	ns	60	9	20
HEISLR	IOOP01	5/3/04	10:45		ns	ns	ns	ns	ns	ns	9	<9	<9
HEISLR	IOOP01	5/11/04	8:10		ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	5/17/04	8:03		ns	ns	ns	ns	ns	ns	20	9	9
HEISLR	IOOP01	5/24/04	8:15		ns	ns	ns	ns	ns	ns	9	<9	<9
HEISLR	IOOP01	6/1/04	10:45		ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	6/7/04	8:21		ns	ns	ns	ns	ns	ns	<9	<9	<9
HEISLR	IOOP01	6/14/04	8:24		ns	ns	ns	ns	ns	ns	9	9	<9
HEISLR	IOOP01	6/22/04	8:05		ns	ns	ns	ns	ns	ns	20	9	<9
HEISLR	IOOP01	6/28/04	8:05		ns	ns	ns	ns	ns	ns	9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	FC	Ent	PIPE / STORM CHANNEL TC	FC	Ent	DOWN COAST (D/C) TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
LADERA		7/2/03	10:13		<10	<10	<10	182000	56000	93000	<10	<10	<10
LADERA		7/9/03	11:02		<10	<10	<10	33000	11000	34400	<10	<10	<10
LADERA		7/16/03	9:39		<10	<10	<10	68000	21000	9700	140	<10	<10
LADERA		7/24/03	12:32		<10	<10	<10	3900	1600	2260	<10	<10	<10
LADERA		7/30/03	10:25	7/30	<10	<10	<10	53000	18000	34000	<10	<10	20
LADERA		8/6/03	10:03		<10	<10	<10	1420	780	150	<10	<10	<10
LADERA		8/13/03	10:38		<10	<10	<10	102000	62000	48000	<10	<10	<10
LADERA		8/20/03	11:35		<10	<10	<10	23000	7000	3700	<10	<10	<10
LADERA		8/25/03	12:30		<10	<10	<10	ns	ns	ns	<10	<10	<10
LADERA		9/3/03	10:45		20	<10	<10	8100	2100	2800	<10	<10	<10
LADERA		9/8/03	12:02		ns	ns	ns	ns	ns	ns	<10	<10	10
LADERA		9/19/03	11:28		<10	<10	10	137000	38000	53000	<10	<10	<10
LADERA		9/22/03	12:18		ns	ns	ns	ns	ns	ns	<10	<10	<10
LADERA		10/1/03	12:15		<10	<10	<10	4500	840	2600	<10	<10	<10
LADERA		10/7/03	12:09		20	<10	<10	23000	7000	10900	30	10	<10
LADERA		10/15/03	11:53		<10	<10	<10	5950	3050	3650	<10	<10	<10
LADERA		10/23/03	10:42		100	40	20	≥ 90000	18000	10900	160	30	30
LADERA		10/30/03	10:34		9	20	<9	≥ 200000	60000	43000	20	<9	9
LADERA		11/13/03	9:28	10/31-11/3	20	<9	9	90000	1000	180000	<9	<9	<9
LADERA		11/20/03	10:21	11/12, 11/16	40	40	20	≥ 15000	1300	18000	40	20	<9
LADERA		12/4/03	11:15		40	<9	<9	108000	32000	8300	30	9	<9
LADERA		12/11/03	11:13	12/11	99	<9	40	240000	21000	152000	90	30	20
LADERA		12/18/03	9:40		9	<9	<9	380000	≥ 180	2300	9	9	20
LADERA		12/23/03	10:40	12/23	<9	<9	<9	24000	5400	5800	30	<9	110
LADERA		12/30/03	11:19	12/25	ns	ns	ns	ns	ns	ns	20	<9	<9
LADERA		1/8/04	11:25	Jan. 2-3	ns	ns	ns	ns	ns	ns	9	9	<9
LADERA		1/15/04	10:33		20	40	<9	≥2,700	100	430	40	30	40
LADERA		1/22/04	12:12		9	<9	40	≥1,300	140	240	40	<9	9
LADERA		1/28/04	11:40		140	9	20	≥51,000	9,400	9,100	240	9	50
LADERA		2/9/04	11:27	Feb. 2-3	9	20	<9	≥ 9,000	4,900	1,320	9	<9	<9
LADERA		2/10/04	11:06		<9	<9	<9	2,000	150	190	9	<9	<9
LADERA		3/1/04	8:02	Feb. 18-26	40	20	9	≥ 6,000	22,000	7,000	50	40	30
LADERA		3/10/04	11:30	Mar. 1-3	30	<9	<9	≥ 7,000	37,000	2,800	<9	<9	<9
LADERA		3/18/04	11:45		<9	<9	<9	≥ 500	280	1,040	9	<9	<9
LADERA		3/25/04	10:52		70	20	9	≥ 3,000	1,500	7,100	20	20	9
LADERA		3/29/04	10:55		9	20	<9	≥ 3,000	440	4,300	30	20	<9
LADERA		4/8/04	8:06	Apr. 1-2	40	9	9	>2,000	570	3,100	40	30	9
LADERA		4/15/04	11:45		<9	9	<9	6,000	210	2,700	<9	<9	<9
LADERA		4/21/04	11:08	Apr. 17	9	<9	<9	1,000	80	3,800	20	<9	9
LADERA		4/29/04	11:05		<9	<9	<9	≥ 1,000	8,000	18,900	<9	<9	<9
LADERA		5/5/04	7:40		9	<9	<9	20,000	14,000	8,500	≥ 20	<9	<9
LADERA		5/12/04	11:25		<9	9	<9	40,000	52,000	53,000	<9	9	<9
LADERA		5/20/04	11:30		<9	<9	<9	≥ 4,000	5,000	57,000	<9	<9	<9
LADERA		5/27/04	11:30		<9	<9	<9	≥ 6,000	25,000	8,800	<9	<9	<9
LADERA		6/3/04	7:59		9	9	30	400,000	100,000	26,000	<9	<9	20
LADERA		6/9/04	10:48		≥99	9	20	50,000	2,000	9,400	<9	<9	<9
LADERA		6/17/04	10:56		<9	<9	<9	≥ 35,000	20,000	7,800	<9	<9	<9
LADERA		6/23/04	11:05		<9	<9	<9	≥ 33,000	5,000	10,500	<9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
LINDAL	MOOS07	7/2/03	9:27		<10	<10	<10	59200	32800	107000	<10	<10	<10
LINDAL	MOOS07	7/9/03	10:13		<10	<10	<10	24100	11900	12600	<10	<10	<10
LINDAL	MOOS07	7/16/03	10:27		<10	<10	<10	6300	2200	13800	<10	<10	<10
LINDAL	MOOS07	7/24/03	11:41		<10	<10	<10	13000	10000	15900	<10	<10	<10
LINDAL	MOOS07	7/30/03	9:38	7/30	9000	2000	1020	24000	9000	7300	28000	6000	3000
LINDAL	MOOS07	8/6/03	9:24		50	<10	<10	37000	22000	8900	40	<10	<10
LINDAL	MOOS07	8/13/03	9:50		<10	<10	<10	2900	1640	1800	20	<10	<10
LINDAL	MOOS07	8/20/03	10:49		50	30	30	24000	12100	7900	70	<10	20
LINDAL	MOOS07	8/25/03	11:21		<10	<10	<10	ns	ns	ns	40	<10	10
LINDAL	MOOS07	9/3/03	9:33		10	<10	<10	23000	3100	10100	30	<10	<10
LINDAL	MOOS07	9/8/03	11:08		10	<10	<10	51000	14900	62000	<10	<10	<10
LINDAL	MOOS07	9/19/03	10:43		20	10	10	31000	6600	8300	20	<10	<10
LINDAL	MOOS07	9/22/03	11:14		20	<10	<10	4100	2900	2700	10	<10	<10
LINDAL	MOOS07	10/1/03	11:33		10	<10	<10	21000	7100	3100	60	20	<10
LINDAL	MOOS07	10/7/03	11:23		20	>10	60	47000	13100	21000	<10	<10	<10
LINDAL	MOOS07	10/15/03	11:06		30	<10	<10	660	220	180	<10	<10	<10
LINDAL	MOOS07	10/23/03	9:55		40	9	<9	210000	82000	680000	30	<9	30
LINDAL	MOOS07	10/30/03	9:47		230	20	30	≥ 27000	590	33000	710	40	9
LINDAL	MOOS07	11/13/03	10:18	10/31-11/3	60	9	<9	≥ 390000	≥ 2100	34000	40	20	<9
LINDAL	MOOS07	11/20/03	9:33	11/12, 11/16	150	9	<9	140000	4300	4900	20	<9	<9
LINDAL	MOOS07	12/4/03	10:28		20	9	<9	≥ 63000	5900	11300	20	<9	9
LINDAL	MOOS07	12/11/03	10:27	12/11	99	20	60	71000	28000	3100	110	40	70
LINDAL	MOOS07	12/18/03	9:06		40	20	30	44000	3100	470	40	<9	<9
LINDAL	MOOS07	12/23/03	9:45		<9	<9	20	≥ 79000	2000	66000	20	<9	<9
LINDAL	MOOS07	12/30/03	10:18	12/25	230	20	<9	≥ 1760000	97000	20000	50	20	30
LINDAL	MOOS07	1/8/04	10:31	Jan. 2-3	30	<9	<9	105,000	8,100	1,330	620	9	30
LINDAL	MOOS07	1/15/04	9:54		20	<9	20	270,000	≥ 6,000	5,500	40	<9	30
LINDAL	MOOS07	1/22/04	11:19		20	<9	<9	470,000	2,900	4,100	50	<9	9
LINDAL	MOOS07	1/28/04	10:50		450	20	50	≥118,000	2,300	3,700	930	40	20
LINDAL	MOOS07	2/9/04	10:30	Feb. 2-3	<9	<9	<9	12,300,000	19,000	13,100	4,900	190	2,800
LINDAL	MOOS07	2/10/04	10:25		30	20	<9	≥ 58,000	10,500	102,000	≥ 940	20	420
LINDAL	MOOS07	3/1/04	8:53	Feb. 18-26	9	<9	<9	1,900,000	12,900	26,000	130	<9	9
LINDAL	MOOS07	3/10/04	10:43	Mar. 1-3	50	9	9	140,000	1,000	11,100	1,100	<9	70
LINDAL	MOOS07	3/15/04	12:30		20	<9	<9	50,000	840	2,000	<9	<9	<9
LINDAL	MOOS07	3/25/04	10:10		20	<9	<9	46,000	5,300	14,300	40	<9	<9
LINDAL	MOOS07	3/29/04	10:00		<9	<9	<9	180,000	37,000	3,600	<9	<9	<9
LINDAL	MOOS07	4/8/04	9:08	Apr. 1-2	9	<9	<9	≥3,000	130	3,100	<9	<9	<9
LINDAL	MOOS07	4/15/04	10:45		60	9	<9	100,000	1,130	4,900	40	9	9
LINDAL	MOOS07	4/21/04	10:25	Apr. 17	40	40	<9	8,000	150	1,080	30	40	<9
LINDAL	MOOS07	4/29/04	10:09		9	<9	9	≥ 13,000	3,700	2,700	<9	9	9
LINDAL	MOOS07	5/5/04	8:36		50	30	<9	20,000	19,000	12,100	50	60	<9
LINDAL	MOOS07	5/12/04	10:30		<9	9	<9	6,000	1,280	25,000	<9	<9	<9
LINDAL	MOOS07	5/20/04	10:35		9	<9	9	≥ 7,000	3,200	23,000	20	<9	<9
LINDAL	MOOS07	5/27/04	10:35		<9	<9	<9	2,000	1,900	3,300	<9	<9	<9
LINDAL	MOOS07	6/3/04	8:55		20	9	9	≥ 38,000	19,000	9,600	40	50	30
LINDAL	MOOS07	6/9/04	9:53		40	30	20	≥ 100,000	10,000	65,000	30	50	<9
LINDAL	MOOS07	6/17/04	10:04		50	20	<9	76,000	140	4,900	30	30	<9
LINDAL	MOOS07	6/23/04	10:19		50	20	9	<9	60	1,900	20	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
MAINBC	I02	7/3/03	8:34		ns	ns	ns	ns	ns	ns	<10	<10	<10
MAINBC	I02	7/10/03	8:43		10	<10	<10	54000	17000	4860	<10	<10	<10
MAINBC	I02	7/17/03	8:19		20	<10	<10	12100	5800	3500	40	<10	30
MAINBC	I02	7/25/03	9:32		<10	<10	<10	6050	155	800	40	<10	30
MAINBC	I02	7/31/03	8:20	7/30	1210	210	10	1020	883	767	370	30	20
MAINBC	I02	8/7/03	8:12		10	<10	<10	23000	8000	3000	<10	<10	<10
MAINBC	I02	8/14/03	8:48		20	<10	<10	54000	12000	5200	<10	<10	<10
MAINBC	I02	8/18/03	9:05		<10	<10	10	ns	ns	ns	<10	<10	<10
MAINBC	I02	8/28/03	7:37		10	<10	<10	30000	25000	640	<10	<10	10
MAINBC	I02	9/5/03	9:07		20	<10	400	26000	6300	6900	20	<10	<10
MAINBC	I02	9/11/03	8:08		<10	<10	<10	62000	21000	13100	30	<10	10
MAINBC	I02	9/15/03	11:10		<10	<10	<10	24000	2500	3100	30	<10	<10
MAINBC	I02	9/25/03	8:10		<10	<10	<10	22000	5800	90	<10	<10	<10
MAINBC	I02	10/2/03	9:57		<10	<10	<10	2100	280	3200	10	<10	<10
MAINBC	I02	10/8/03	9:47		10	<10	<10	4100	2000	5300	20	<10	<10
MAINBC	I02	10/16/03	10:29		20	<10	10	6500	3500	6900	70	<10	10
MAINBC	I02	10/22/03	8:22		50	20	<9	≥ 15000	≥ 390	370	30	40	20
MAINBC	I02	10/27/03	9:24		200	130	200	≥1300	230	220	130	90	130
MAINBC	I02	11/10/03	10:12	10/31-11/3	200	70	9	> 41000	330	460	130	70	9
MAINBC	I02	11/17/03	9:19	11/12, 11/16	110	<9	<9	≥73000	2600	930	210	20	<9
MAINBC	I02	12/3/03	9:18		70	99	20	40000	190	1140	90	50	20
MAINBC	I02	12/8/03	8:47	12/7	40	20	9	270000	10400	11800	≥ 10500	430	650
MAINBC	I02	12/15/03	9:05	12/14	260	70	60	46000	26000	≥ 9500	520	280	140
MAINBC	I02	12/22/03	8:12		250	220	60	17000	4200	≥ 990	320	260	150
MAINBC	I02	12/29/03	8:34	12/25	20	20	20	2200	910	680	180	99	40
MAINBC	I02	1/6/04	8:10	Jan. 2-3	290	240	20	≥ 4,800	500	1,090	130	100	<9
MAINBC	I02	1/12/04	8:32		40	40	20	13,000	8,100	2,800	20	30	9
MAINBC	I02	1/20/04	8:45		ns	ns	ns	ns	ns	ns	120	70	60
MAINBC	I02	1/26/04	8:22		370	150	140	≥ 17,000	800	830	220	80	40
MAINBC	I02	2/2/04	9:45		580	240	130	≥3,400	330	750	560	340	260
MAINBC	I02	2/11/04	9:43	Feb. 2-3	200	60	40	11,500	8,500	400	250	140	30
MAINBC	I02	2/17/04	9:10		40	40	9	1,600	400	330	80	50	20
MAINBC	I02	3/4/04	11:07	Feb. 18-26, Mar. 1-3	420	9	80	4,100	120	760	<9	<9	<9
MAINBC	I02	3/8/04	9:48		60	<9	20	700	1,110	940	40	9	9
MAINBC	I02	3/18/04	8:35		270	60	140	≥ 4,700	620	2,200	40	100	30
MAINBC	I02	3/22/04	8:59		130	9	20	3,500	460	770	170	40	<9
MAINBC	I02	4/1/04	8:31		20	30	9	≥ 1,500	410	982	210	9	20
MAINBC	I02	4/5/04	10:55	Apr. 1-2	40	9	50	≥ 3,100	6,900	60,000	30	<9	<9
MAINBC	I02	4/12/04	8:25		60	110	9	≥ 5,300	3,100	1,400	250	120	30
MAINBC	I02	4/19/04	8:30	Apr. 17	20	<9	<9	5,800	2,300	610	<9	<9	9
MAINBC	I02	4/27/04	8:30		50	<9	30	1,500	430	1,040	40	<9	<9
MAINBC	I02	5/3/04	10:24		9	<9	9	≥ 12,000	370	810	9	<9	9
MAINBC	I02	5/11/04	8:22		ns	ns	ns	ns	ns	ns	<9	<9	<9
MAINBC	I02	5/17/04	8:15		ns	ns	ns	ns	ns	ns	<9	<9	20
MAINBC	I02	5/24/04	8:25		ns	ns	ns	ns	ns	ns	<9	<9	<9
MAINBC	I02	6/1/04	10:35		ns	ns	ns	ns	ns	ns	<9	<9	<9
MAINBC	I02	6/7/04	8:32		ns	ns	ns	ns	ns	ns	<9	<9	<9
MAINBC	I02	6/14/04	8:35		ns	ns	ns	ns	ns	ns	<9	<9	<9
MAINBC	I02	6/22/04	8:05		ns	ns	ns	ns	ns	ns	40	9	<9
MAINBC	I02	6/28/04	8:16		ns	ns	ns	ns	ns	ns	20	9	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
MARIPO		7/2/03	9:14		<10	<10	<10	16700	8450	67000	<10	<10	<10
MARIPO		7/9/03	9:58		20	<10	<10	32000	18000	21600	<10	<10	<10
MARIPO		7/16/03	10:39		<10	<10	<10	93000	41000	26000	60	<10	10
MARIPO		7/24/03	11:21		<10	<10	<10	214000	38000	77000	<10	<10	<10
MARIPO		7/30/03	9:15	7/30	23000	5000	13000	69000	13000	13400	870	80	130
MARIPO		8/6/03	9:12		30	<10	<10	15000	4000	5000	20	<10	<10
MARIPO		8/13/03	9:40		30	<10	<10	194000	127000	42000	980	40	350
MARIPO		8/20/03	10:28		10	<10	10	21000	13900	3300	180	20	10
MARIPO		8/25/03	11:00		30	<10	10	89000	36000	82000	10	<10	<10
MARIPO		9/3/03	9:33		40	10	10	43000	22000	31000	70	20	20
MARIPO		9/8/03	10:50		40	<10	20	69000	22000	45000	20	<10	30
MARIPO		9/19/03	10:26		110	20	20	114000	49000	56000	190	20	30
MARIPO		9/22/03	11:00		<10	<10	<10	139000	87000	24000	10	<10	<10
MARIPO		10/1/03	11:13		30	10	10	88000	7800	16600	220	90	20
MARIPO		10/7/03	11:08		<10	<10	<10	60000	20000	5100	<10	<10	30
MARIPO		10/15/03	10:51		140	70	<10	106000	8650	13900	150	<10	10
MARIPO		10/23/03	9:20		40	9	20	58000	4800	10400	30	20	9
MARIPO		10/30/03	9:34		≥ 390	9	130	260000	26000	17400	150	<9	9
MARIPO		11/13/03	10:40	10/31-11/3	40	9	<9	≥ 52000	7100	16400	50	20	9
MARIPO		11/20/03	9:16	11/12, 11/16	120	<9	<9	73000	3700	6000	420	9	<9
MARIPO		12/4/03	10:07		20	20	<9	1200000	135000	24000	9	<9	<9
MARIPO		12/11/03	10:11	12/11	130	20	20	≥ 1440000	33000	20000	70	40	30
MARIPO		12/18/03	8:54		20	30	9	≥ 94000	2900	6200	60	9	30
MARIPO		12/23/03	9:30		20	30	20	≥ 106000	20000	13200	30	<9	<9
MARIPO		12/30/03	9:59	12/25	20	<9	40	380000	1060	4200	30	20	20
MARIPO		1/8/04	10:14	Jan. 2-3	70	30	20	46,000	160	19,000	80	30	30
MARIPO		1/15/04	9:42		40	<9	<9	≥ 74,000	2,400	3,000	20	<9	20
MARIPO		1/22/04	11:02		110	<9	30	≥ 157,000	270	2,000	50	9	40
MARIPO		1/28/04	10:30		410	9	80	≥145,000	1,800	8,900	430	20	80
MARIPO		2/9/04	10:15	Feb. 2-3	9	<9	<9	36,000	140	2,700	<9	<9	<9
MARIPO		2/10/04	10:09		9	<9	9	55,000	110	820	<9	<9	<9
MARIPO		3/1/04	9:05	Feb. 18-26	<9	<9	<9	7,000	950	780	20	<9	<9
MARIPO		3/10/04	10:28	Mar. 1-3	20	<9	9	100,000	370	60,000	<9	<9	20
MARIPO		3/15/04	12:16		<9	<9	<9	1,300,000	7,900	23,000	<9	<9	<9
MARIPO		3/25/04	9:52		99	<9	<9	≥ 43,000	560	5,300	30	9	<9
MARIPO		3/29/04	9:43		<9	<9	<9	6,800,000	≥ 3,200	5,300	<9	<9	<9
MARIPO		4/8/04	9:30	Apr. 1-2	<9	<9	<9	≥79,000	1,400	24,000	9	9	<9
MARIPO		4/15/04	10:20		<9	<9	<9	200,000	9,200	19,200	150	20	<9
MARIPO		4/21/04	10:06	Apr. 17	<9	<9	<9	10,000	200	3,600	9	<9	<9
MARIPO		4/29/04	9:50		40	30	9	≥ 9,000	9,000	14,600	50	40	9
MARIPO		5/5/04	9:00		60	60	40	91,000	22,000	43,000	40	20	<9
MARIPO		5/12/04	10:05		<9	<9	<9	50,000	20,000	15,600	<9	<9	<9
MARIPO		5/20/04	10:16		<9	<9	<9	≥ 15,000	9,000	16,100	9	<9	<9
MARIPO		5/27/04	10:20		<9	<9	<9	≥ 24,000	13,400	6,200	<9	<9	<9
MARIPO		6/3/04	9:12		<9	<9	30	≥ 47,000	43,000	45,000	30	20	20
MARIPO		6/9/04	9:35		30	20	20	180,000	8,400	14,600	30	40	20
MARIPO		6/17/04	9:46		60	40	20	1,640,000	21,000	19,000	20	40	9
MARIPO		6/23/04	9:58		9	<9	9	490,000	7,000	31,000	30	20	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	FC	Ent	PIPE / STORM CHANNEL TC	FC	Ent	DOWN COAST (D/C) TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
PEARL		7/3/03	9:10		<10	<10	<10	5600	1150	970	<10	<10	<10
PEARL		7/10/03	9:35		<10	<10	<10	3900	2650	1990	10	<10	<10
PEARL		7/17/03	9:12		<10	<10	<10	4500	2700	800	470	210	1990
PEARL		7/25/03	10:10		<10	<10	<10	<10	<10	<10	<10	<10	<10
PEARL		7/31/03	9:14	7/30	40	20	10	2120	910	125	30	<10	<10
PEARL		8/7/03	8:58		<10	<10	<10	11000	4000	2140	<10	<10	10
PEARL		8/14/03	9:21		10	<10	<10	16000	4700	2800	<10	<10	<10
PEARL		8/18/03	9:43		10	<10	<10	2900	740	930	<10	<10	<10
PEARL		8/28/03	8:06		<10	<10	<10	4600	2550	520	10	<10	<10
PEARL		9/5/03	9:36		<10	<10	<10	16200	2300	7000	<10	<10	<10
PEARL		9/11/03	8:56		<10	<10	<10	790	220	180	20	<10	10
PEARL		9/15/03	11:41		<10	<10	30	4300	310	430	20	<10	10
PEARL		9/25/03	8:45		10	<10	<10	2900	1760	110	<10	<10	<10
PEARL		10/2/03	10:40		<10	<10	<10	600	310	720	<10	<10	<10
PEARL		10/8/03	10:19		20	<10	<10	25000	21000	33000	40	<10	10
PEARL		10/16/03	11:01		10	<10	<10	36000	21000	8820	<10	<10	<10
PEARL		10/22/03	9:13		20	9	<9	230000	≥ 410	1230	9	<9	<9
PEARL		10/27/03	9:59		880	70	70	1100000	10000	16000	80	40	60
PEARL		11/10/03	10:56	10/31-11/3	150	40	<9	480000	7700	6600	50	90	20
PEARL		11/17/03	10:05	11/12, 11/16	30	9	<9	26000	900	1370	9	<9	<9
PEARL		12/3/03	10:07		70	20	20	3900	100	990	40	40	9
PEARL		12/8/03	9:34	12/7	340	30	50	≥ 30000	2100	7200	400	30	50
PEARL		12/15/03	9:44	12/14	30	<9	9	≥ 135000	12000	≥ 1000	9	20	20
PEARL		12/22/03	9:06		50	<9	40	220000	21000	≥ 45000	40	9	50
PEARL		12/29/03	9:20	12/25	9	<9	<9	14000	4000	680	80	<9	<9
PEARL		1/6/04	9:11	Jan. 2-3	20	9	<9	6,000	200	200	9	<9	9
PEARL		1/12/04	9:25		9	<9	<9	1,000,000	41,000	1,120,000	20	9	9
PEARL		1/20/04	9:35		160	120	150	8,300,000	270,000	1,400	210	110	130
PEARL		1/26/04	9:14		20	<9	<9	35,000	680	780	20	9	<9
PEARL		2/2/04	10:36		30	<9	9	64,000	2,800	4,800	9	<9	20
PEARL		2/11/04	10:35	Feb. 2-3	<9	<9	<9	32,000	400	140	9	<9	<9
PEARL		2/17/04	10:03		<9	<9	30	21,000	80	280	9	9	<9
PEARL		3/4/04	10:08	Feb. 18-26,	40	<9	<9	≥1,000	160	820	30	9	<9
PEARL		3/8/04	10:32		<9	<9	<9	4,000	90	120	9	<9	<9
PEARL		3/18/04	9:24		<9	<9	<9	430,000	29,000	9,500	20	<9	<9
PEARL		3/22/04	10:19		40	30	9	≥ 41,000	1,300	31,000	9	<9	<9
PEARL		4/1/04	9:15		20	9	9	3,500	120	80	9	9	<9
PEARL		4/5/04	10:05	Apr. 1-2	9	<9	<9	14,900	890	1,120	<9	9	9
PEARL		4/12/04	9:11		9	9	<9	18,000	12,900	5,000	40	<9	30
PEARL		4/19/04	9:12	Apr. 17	<9	9	<9	24,000	250	530	<9	<9	<9
PEARL		4/27/04	9:15		<9	<9	<9	2,500	580	680	<9	<9	<9
PEARL		5/3/04	9:40		20	<9	<9	30,000	70,000	21,000	<9	<9	<9
PEARL		5/11/04	8:54		<9	<9	<9	≥ 1,900	5,200	500	<9	<9	<9
PEARL		5/17/04	8:45		<9	<9	<9	≥ 6,000	22,000	70,000	20	<9	<9
PEARL		5/24/04	9:00		<9	<9	<9	600,000	460,000	173,000	<9	<9	<9
PEARL		6/1/04	9:56		<9	<9	<9	14,000	2,600	5,600	<9	<9	<9
PEARL		6/7/04	9:13		<9	<9	<9	≥ 22,000	22,000	94,000	20	<9	<9
PEARL		6/14/04	9:16		<9	<9	<9	69,000	1,600	1,580	<9	<9	<9
PEARL		6/22/04	8:54		<9	<9	<9	5,800	260	110	<9	<9	<9
PEARL		6/28/04	8:52		<9	<9	<9	2,000,000	22,000	20,000	<9	9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
PICO	M02	7/2/03	8:54		30	<10	<10	10800	6600	16100	<10	<10	<10
PICO	M02	7/9/03	9:30		30	<10	70	16400	6600	8150	<10	<10	10
PICO	M02	7/16/03	10:53		<10	<10	<10	14000	4000	9550	<10	<10	<10
PICO	M02	7/24/03	11:07		<10	<10	<10	14400	1950	1760	<10	<10	<10
PICO	M02	7/30/03	9:05	7/30	16000	2000	7000	39000	3000	47000	16000	750	6000
PICO	M02	8/6/03	8:57		<10	<10	40	19000	6000	2260	60	<10	<10
PICO	M02	8/13/03	9:00		60	<10	<10	2700	2400	2200	60	10	<10
PICO	M02	8/20/03	9:58		600	70	10	17000	7100	4700	<10	<10	<10
PICO	M02	8/25/03	10:45		210	60	40	27000	6700	9300	30	<10	40
PICO	M02	9/3/03	9:15		60	10	<10	9900	4700	3700	20	<10	20
PICO	M02	9/8/03	10:32		50	<10	20	27000	7500	8100	<10	<10	<10
PICO	M02	9/19/03	10:09		80	20	90	5800	1620	6300	90	20	70
PICO	M02	9/22/03	10:45		290	90	160	7000	3300	2200	70	30	30
PICO	M02	10/1/03	10:58		50	20	10	12200	7100	5200	30	10	<10
PICO	M02	10/7/03	10:54		10	<10	30	5500	2300	860	50	10	40
PICO	M02	10/15/03	10:35		140	20	30	3850	1600	770	70	10	30
PICO	M02	10/23/03	9:06		40	<9	<9	35000	2600	4200	460	30	40
PICO	M02	10/30/03	9:20		440	50	40	≥ 18000	1300	1760	220	120	160
PICO	M02	11/13/03	11:01	10/31-11/3	40	20	30	140000	4000	7100	≥ 350	50	150
PICO	M02	11/20/03	9:00	11/12, 11/16	110	9	30	32000	2100	11200	500	9	130
PICO	M02	12/4/03	9:39		60	70	120	≥ 6800	600	4800	160	40	150
PICO	M02	12/11/03	9:37	12/11	50	<9	60	36000	2800	5900	≥ 560	70	200
PICO	M02	12/18/03	8:40		80	50	20	22000	1300	2600	20	30	20
PICO	M02	12/23/03	9:10		830	140	200	26000	1350	1610	1250	140	180
PICO	M02	12/30/03	9:36	12/25	270	170	60	≥ 10000	1380	1050	≥ 1160	180	180
PICO	M02	1/8/04	9:52	Jan. 2-3	ns-hs	ns-hs	ns-hs	≥ 12,200	610	830	330	40	30
PICO	M02	1/15/04	9:29		9	<9	9	≥ 5,900	1,050	1,160	210	30	40
PICO	M02	1/22/04	10:42		ns-hs	ns-hs	ns-hs	20,000	700	840	750	30	60
PICO	M02	1/28/04	10:10		210	20	80	43,000	4,300	10,000	≥1,480	210	430
PICO	M02	2/9/04	9:55	Feb. 2-3	9	<9	<9	770	140	50	50	<9	<9
PICO	M02	2/10/04	9:50		ns-hs	ns-hs	ns-hs	10,000	320	1,580	270	40	100
PICO	M02	3/1/04	9:30	Feb. 18-26	50	9	9	4,600	140	140	160	9	20
PICO	M02	3/10/04	10:10	Mar. 1-3	ns-hs	ns-hs	ns-hs	5,000	2,000	3,400	210	100	130
PICO	M02	3/15/04	11:58		30	<9	9	28,000	3,400	1,540	2,400	110	150
PICO	M02	3/25/04	9:35		ns-hs	ns-hs	ns-hs	≥ 22,000	940	640	260	9	9
PICO	M02	3/29/04	9:25		9	<9	<9	≥ 11,000	5,300	8,100	≥ 220	60	90
PICO	M02	4/8/04	9:50	Apr. 1-2	40	9	<9	4,000	2,000	550	150	30	9
PICO	M02	4/15/04	9:55		ns-hs	ns-hs	ns-hs	≥10,000	3,700	1,500	120	40	40
PICO	M02	4/21/04	9:50	Apr. 17	60	<9	<9	36,000	1,700	2,600	2,400	20	99
PICO	M02	4/29/04	9:33		ns-hs	ns-hs	ns-hs	≥ 7,000	2,800	2,000	40	30	<9
PICO	M02	5/5/04	9:22		ns-hs	ns-hs	ns-hs	7,000	2,800	3,100	20	20	<9
PICO	M02	5/12/04	9:45		120	<9	<9	≥ 16,000	≥ 2,500	3,000	700	≥ 30	110
PICO	M02	5/20/04	9:58		ns-hs	ns-hs	ns-hs	≥ 2,000	3,200	3,500	30	9	<9
PICO	M02	5/27/04	10:00		<9	20	<9	≥ 90	2,500	1,250	9	9	<9
PICO	M02	6/3/04	9:34		ns-hs	ns-hs	ns-hs	3,000	2,000	2,200	≥ 30	40	40
PICO	M02	6/9/04	9:20		<9	<9	9	2,000	480	940	<9	<9	<9
PICO	M02	6/17/04	9:26		40	<9	<9	≥ 400	1,900	540	30	<9	<9
PICO	M02	6/23/04	9:40		<9	20	9	<9	800	950	30	40	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
PIER		7/2/03	9:41		<10	<10	<10	383000	136000	18200	<10	<10	<10
PIER		7/9/03	10:27		50	<10	<10	132000	71000	23400	<10	<10	<10
PIER		7/16/03	10:12		20	<10	50	24000	6000	19000	<10	<10	<10
PIER		7/24/03	11:56		<10	<10	<10	36000	24000	5700	<10	<10	<10
PIER		7/30/03	9:50	7/30	970	180	360	25000	7000	14400	390	90	690
PIER		8/6/03	9:37		<10	<10	<10	1500	800	250	<10	<10	10
PIER		8/13/03	10:05		150	60	50	220	20	70	20	<10	200
PIER		8/20/03	11:03		20	<10	30	7600	2400	5600	<10	<10	<10
PIER		8/25/03	11:34		90	10	<10	76000	23000	93000	40	10	30
PIER		9/3/03	10:08		140	20	20	29000	7600	51000	70	10	20
PIER		9/8/03	11:24		220	160	190	79000	31000	67000	10	<10	10
PIER		9/19/03	10:59		180	40	10	176000	72000	12700	110	40	10
PIER		9/22/03	11:42		<10	<10	<10	4300	2900	5500	<10	<10	<10
PIER		10/1/03	11:44		1960	760	350	58000	23000	3600	10	<10	<10
PIER		10/7/03	11:40		<10	<10	<10	92000	27000	4700	30	>10	10
PIER		10/15/03	11:20		40	<10	<10	12400	6700	8800	80	10	<10
PIER		10/23/03	10:09		40	9	<9	4900000	45000	19000	100	9	30
PIER		10/30/03	10:03		5300	70	40	4500000	38000	9800	30	<9	9
PIER		11/13/03	10:06	10/31-11/3	560	20	9	≥ 330000	9820	13900	40	<9	<9
PIER		11/20/03	9:39	11/12, 11/16	270	210	200	5100000	53000	5500	140	140	40
PIER		12/4/03	10:42		30	9	<9	2500000	89000	69000	30	<9	9
PIER		12/11/03	10:39	12/11	160	9	40	20000	210	360	80	30	60
PIER		12/18/03	9:13		20	<9	20	59000	220	940	70	40	9
PIER		12/23/03	10:03		150	40	20	54000	680	860	130	110	40
PIER		12/30/03	10:35	12/25	40	30	<9	119000	320	2400	70	40	<9
PIER		1/8/04	10:47	Jan. 2-3	30	<9	30	45,000	60	1,960	250	180	40
PIER		1/15/04	10:06		50	60	40	≥ 111,000	600	1,220	60	30	40
PIER		1/22/04	11:37		<9	9	20	63,000	1,400	12,600	30	<9	30
PIER		1/28/04	11:05		≥1,220	40	40	240,000	3,400	3,600	450	110	50
PIER		2/9/04	10:45	Feb. 2-3	130	40	70	96,000	180	900	250	130	40
PIER		2/10/04	10:40		9	20	20	57,000	3,600	710	120	60	40
PIER		3/1/04	8:38	Feb. 18-26	210	20	30	27,000	490	540	210	40	60
PIER		3/10/04	11:00	Mar. 1-3	30	40	9	4,000	30	3,600	40	30	<9
PIER		3/15/04	12:45		20	20	<9	9,000,000	≥ 6,000	4,800	50	9	<9
PIER		3/25/04	10:25		9	<9	9	137,000	110	3,900	20	9	<9
PIER		3/29/04	10:25		20	30	<9	260,000	500	1,610	110	110	<9
PIER		4/8/04	8:46	Apr. 1-2	330	220	40	≥198,000	4,300	840	340	190	99
PIER		4/15/04	11:05		9	9	<9	67,000	220	1,400	9	9	<9
PIER		4/21/04	10:40	Apr. 17	60	170	90	57,000	25,000	2,300	90	110	20
PIER		4/29/04	10:30		40	30	110	44,000	140	870	330	380	140
PIER		5/5/04	8:17		1,040	860	450	44,000	9,400	140,000	120	60	<9
PIER		5/12/04	10:50		170	70	9	260,000	570	1,840	590	550	30
PIER		5/20/04	10:55		9	20	20	40,000	400	1,320	580	550	<9
PIER		5/27/04	10:55		40	40	<9	260,000	7,800	10,000	30	80	9
PIER		6/3/04	8:35		870	470	230	26,000	13,000	9,700	240	160	50
PIER		6/9/04	10:11		310	300	90	≥ 3,000,000	50,000	5,200	340	320	20
PIER		6/17/04	10:23		80	99	40	220,000	≥ 2,900	<9	30	50	<9
PIER		6/23/04	10:36		130	120	30	900,000	2,000	6,500	20	9	20

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
POCHE	M01	7/2/03	8:18		30	20	40	8100	2700	7450	<10	<10	<10
POCHE	M01	7/9/03	8:52		420	130	350	39000	17000	13500	<10	<10	90
POCHE	M01	7/16/03	11:20		<10	<10	<10	4850	1550	2900	<10	<10	<10
POCHE	M01	7/24/03	10:27		565	30	110	17000	12000	5760	30	<10	<10
POCHE	M01	7/30/03	8:33	7/30	610	350	710	15000	6000	5000	410	40	70
POCHE	M01	8/6/03	8:30		<10	<10	20	4200	3600	2640	120	50	260
POCHE	M01	8/13/03	8:35		80	40	20	37000	26000	5100	<10	<10	<10
POCHE	M01	8/20/03	9:20		220	60	130	28000	7100	3500	<10	<10	<10
POCHE	M01	8/25/03	10:05		<10	<10	<10	8400	2600	13300	30	10	60
POCHE	M01	9/3/03	8:34		190	60	270	10400	4800	11400	10	<10	<10
POCHE	M01	9/8/03	9:55		740	620	680	37000	31000	45000	10	<10	20
POCHE	M01	9/19/03	9:34		360	110	70	39000	23000	21000	350	120	30
POCHE	M01	9/22/03	10:07		150	30	30	5100	2700	6100	10	<10	<10
POCHE	M01	10/1/03	10:25		230	40	30	42000	21000	23000	20	<10	<10
POCHE	M01	10/7/03	10:23		<10	<10	<10	3900	2000	28000	10	<10	1030
POCHE	M01	10/15/03	10:03		10	<10	<10	38000	5450	9650	30	<10	<10
POCHE	M01	10/23/03	8:20		40	9	9	42000	17000	8200	≥ 1000	230	240
POCHE	M01	10/30/03	8:36		≥ 450	130	110	≥ 37000	6500	6000	50	40	20
POCHE	M01	11/13/03	11:44	10/31-11/3	340	40	50	≥ 30000	6900	4100	9	9	<9
POCHE	M01	11/20/03	8:18	11/12, 11/16	50	<9	20	13000	3400	3500	210	60	70
POCHE	M01	12/4/03	9:07		9	<9	<9	5000	1500	2100	340	60	140
POCHE	M01	12/11/03	9:02	12/11	100	20	99	17000	3300	3900	260	50	150
POCHE	M01	12/18/03	8:18		30	<9	40	≥ 3800	770	2400	20	<9	20
POCHE	M01	12/23/03	8:20		<9	<9	9	≥ 3800	1320	2000	<9	9	30
POCHE	M01	12/30/03	8:51	12/25	70	<9	40	> 6600	1400	2000	≥ 350	9	170
POCHE	M01	1/8/04	8:58	Jan. 2-3	20	20	9	≥ 4,400	890	2,800	240	30	140
POCHE	M01	1/15/04	8:45		90	30	40	14,000	≥ 2,200	2,900	290	30	170
POCHE	M01	1/22/04	9:50		20	30	9	25,000	4,900	2,400	9	9	<9
POCHE	M01	1/28/04	9:00		230	40	60	30,000	2,200	5,900	≥ 660	120	570
POCHE	M01	2/9/04	9:05	Feb. 2-3	<9	<9	<9	5,500	1,700	1,410	99	<9	40
POCHE	M01	2/10/04	9:02		40	20	50	7,200	2,500	3,600	270	40	130
POCHE	M01	3/1/04	10:15	Feb. 18-26	500	20	<9	19,000	2,200	350	280	<9	9
POCHE	M01	3/10/04	9:33	Mar. 1-3	40	< 9	< 9	≥ 2,100	2,000	2,600	130	20	20
POCHE	M01	3/15/04	11:12		60	<9	9	3,400	2,200	470	30	<9	<9
POCHE	M01	3/25/04	8:51		9	<9	<9	≥ 2600	280	320	30	<9	<9
POCHE	M01	3/29/04	8:40		<9	<9	<9	≥ 2,100	420	620	140	<9	9
POCHE	M01	4/8/04	10:40	Apr. 1-2	<9	<9	<9	≥3,500	1,400	1,400	<9	<9	<9
POCHE	M01	4/15/04	9:06		9	<9	20	≥ 1,700	560	760	≥180	30	30
POCHE	M01	4/21/04	9:05	Apr. 17	<9	<9	<9	1,600	2,600	1,240	40	30	20
POCHE	M01	4/29/04	8:46		≥ 60	<9	30	≥ 700	360	880	40	9	<9
POCHE	M01	5/5/04	10:10		40	40	20	≥ 800	600	920	40	<9	<9
POCHE	M01	5/12/04	8:50		9	<9	<9	1,000	3,100	4,800	≥ 440	210	400
POCHE	M01	5/20/04	9:12		70	20	<9	7,000	4,200	4,000	40	<9	20
POCHE	M01	5/27/04	9:11		9	9	9	4,000	2,900	2,700	≥ 250	70	150
POCHE	M01	6/3/04	10:20		≥ 40	60	30	≥ 3,000	3,700	4,700	9	30	9
POCHE	M01	6/9/04	8:40		60	40	9	≥ 2,000	37,000	8,100	40	20	9
POCHE	M01	6/17/04	8:51		150	40	120	≥ 30,000	9,000	6,800	20	<9	<9
POCHE	M01	6/23/04	9:02		1,900	440	1,470	≥ 26,000	4,400	14,900	20	9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
RIVERA	MOOS04	7/2/03	10:28		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	7/9/03	11:20		ns	ns	ns	ns	ns	ns	<10	<10	10
RIVERA	MOOS04	7/16/03	9:21		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	7/24/03	12:48		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	7/30/03	10:43	7/30	ns	ns	ns	41000	9000	12100	<10	<10	<10
RIVERA	MOOS04	8/6/03	10:25		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	8/13/03	10:58		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	8/20/03	11:58		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	8/25/03	12:48		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	9/3/03	11:02		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	9/8/03	12:19		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	9/19/03	11:46		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	9/22/03	12:30		ns	ns	ns	ns	ns	ns	<10	<10	<10
RIVERA	MOOS04	10/1/03	12:29		ns	ns	ns	ns	ns	ns	140	30	<10
RIVERA	MOOS04	10/7/03	12:31		ns	ns	ns	ns	ns	ns	10	<10	<10
RIVERA	MOOS04	10/15/03	12:10		ns	ns	ns	ns	ns	ns	210	<10	10
RIVERA	MOOS04	10/23/03	10:59		ns	ns	ns	ns	ns	ns	80	30	40
RIVERA	MOOS04	10/30/03	10:54		ns	ns	ns	ns	ns	ns	<9	<9	<9
RIVERA	MOOS04	11/13/03	9:11	10/31-11/3	<9	9	<9	≥ 67000	2600	3500	<9	<9	<9
RIVERA	MOOS04	11/20/03	10:46	11/12, 11/16	<9	<9	<9	2600	140	210	20	<9	<9
RIVERA	MOOS04	12/4/03	11:37		20	<9	9	≥ 460	40	130	9	<9	<9
RIVERA	MOOS04	12/11/03	11:32	12/11	500	40	90	≥ 23000	5700	26000	60	30	30
RIVERA	MOOS04	12/18/03	10:00		<9	30	20	4200	1300	1930	<9	9	<9
RIVERA	MOOS04	12/23/03	11:01	12/23	<9	<9	<9	23000	1350	1030	<9	<9	<9
RIVERA	MOOS04	12/30/03	11:41	12/25	<9	<9	<9	4900	230	140	9	20	9
RIVERA	MOOS04	1/8/04	11:45	Jan. 2-3	9	<9	<9	880	120	110	9	9	<9
RIVERA	MOOS04	1/15/04	10:51		9	9	<9	≥ 480	50	140	9	20	<9
RIVERA	MOOS04	1/22/04	12:10		9	20	<9	≥ 450	90	110	<9	30	9
RIVERA	MOOS04	1/28/04	12:00		130	9	20	≥ 70,000	7,600	20,000	99	9	9
RIVERA	MOOS04	2/9/04	11:45	Feb. 2-3	<9	<9	<9	2,100	20	290	9	<9	20
RIVERA	MOOS04	2/10/04	11:30		<9	<9	<9	≥ 470	70	220	<9	<9	<9
RIVERA	MOOS04	3/1/04	7:40	Feb. 18-26	<9	9	<9	700	90	170	9	<9	9
RIVERA	MOOS04	3/10/04	11:55	Mar. 1-3	<9	<9	<9	≥ 210	40	130	<9	<9	<9
RIVERA	MOOS04	3/18/04	12:03		<9	<9	<9	≥ 280	50	250	9	<9	<9
RIVERA	MOOS04	3/25/04	11:15		9	<9	<9	≥ 320	<9	280	<9	<9	<9
RIVERA	MOOS04	3/29/04	11:20		<9	<9	<9	1,600	20	7,100	<9	<9	<9
RIVERA	MOOS04	4/8/04	7:40	Apr. 1-2	<9	<9	<9	≥2,700	130	3,000	<9	30	20
RIVERA	MOOS04	4/15/04	12:05		9	<9	<9	≥13,000	570	3,900	<9	9	<9
RIVERA	MOOS04	4/21/04	11:35	Apr. 17	<9	<9	<9	2,000	160	1,530	<9	<9	<9
RIVERA	MOOS04	4/29/04	11:34		<9	<9	<9	≥ 280	20	≥920	<9	<9	<9
RIVERA	MOOS04	5/5/04	7:20		ns	ns	ns	ns	ns	ns	<9	<9	<9
RIVERA	MOOS04	5/12/04	11:50		ns	ns	ns	ns	ns	ns	9	<9	<9
RIVERA	MOOS04	5/20/04	11:54		ns	ns	ns	ns	ns	ns	<9	<9	<9
RIVERA	MOOS04	5/27/04	12:03		<9	<9	<9	≥ 7,600	3,000	8,700	<9	<9	<9
RIVERA	MOOS04	6/3/04	7:45		ns	ns	ns	ns	ns	ns	<9	9	<9
RIVERA	MOOS04	6/9/04	11:15		<9	<9	<9	1,000	300	1,800	<9	<9	<9
RIVERA	MOOS04	6/17/04	11:20		ns	ns	ns	ns	ns	ns	<9	<9	<9
RIVERA	MOOS04	6/23/04	11:31		<9	<9	<9	≥ 9,000	60	2,900	<9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	FC	Ent	PIPE / STORM CHANNEL TC	FC	Ent	DOWN COAST (D/C) TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
SCCS17		7/2/03	8:47		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		7/9/03	9:25		ns	ns	ns	ns	ns	ns	70	<10	30
SCCS17		7/16/03	11:04		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		7/24/03	10:49		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		7/30/03	8:54	7/30	ns	ns	ns	ns	ns	ns	190	20	330
SCCS17		8/6/03	8:49		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		8/13/03	8:57		ns	ns	ns	ns	ns	ns	60	<10	<10
SCCS17		8/20/03	9:44		ns	ns	ns	ns	ns	ns	40	<10	<10
SCCS17		8/25/03	10:33		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		9/3/03	9:05		ns	ns	ns	ns	ns	ns	30	<10	10
SCCS17		9/8/03	10:21		ns	ns	ns	ns	ns	ns	30	<10	10
SCCS17		9/19/03	10:00		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		9/22/03	10:35		ns	ns	ns	ns	ns	ns	40	10	40
SCCS17		10/1/03	10:53		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS17		10/7/03	10:48		ns	ns	ns	ns	ns	ns	<10	<10	50
SCCS17		10/15/03	10:26		ns	ns	ns	ns	ns	ns	20	10	10
SCCS17		10/23/03	8:58		ns	ns	ns	ns	ns	ns	9	<9	<9
SCCS17		10/30/03	9:13		ns	ns	ns	ns	ns	ns	240	40	70
SCCS17		11/13/03	11:13	10/31-11/3	ns	ns	ns	ns	ns	ns	200	40	40
SCCS17		11/20/03	8:56	11/12, 11/16	ns	ns	ns	ns	ns	ns	40	9	<9
SCCS17		12/4/03	9:33		ns	ns	ns	ns	ns	ns	<9	<9	<9
SCCS17		12/11/03	9:25	12/11	ns	ns	ns	ns	ns	ns	60	30	80
SCCS17		12/18/03	8:36		ns	ns	ns	ns	ns	ns	9	20	20
SCCS17		12/23/03	9:00		ns	ns	ns	ns	ns	ns	90	<9	9
SCCS17		12/30/03	9:22	12/25	140	40	60	> 410	330	3200	80	70	30
SCCS17		1/8/04	9:39	Jan. 2-3	40	<9	20	> 90	70	570	30	<9	<9
SCCS17		1/15/04	9:14		20	20	30	≥ 210	50	770	60	30	40
SCCS17		1/22/04	10:31		<9	20	9	≥ 400	200	900	9	9	9
SCCS17		1/28/04	9:50		210	80	70	≥1,500	420	1,600	300	40	40
SCCS17		2/9/04	9:40	Feb. 2-3	60	20	20	350	260	1,370	120	40	9
SCCS17		2/10/04	9:35		<9	<9	9	550	320	1,170	90	50	40
SCCS17		3/1/04	9:45	Feb. 18-26	20	<9	9	700	960	490	9	9	<9
SCCS17		3/10/04	10:00	Mar. 1-3	< 9	<9	<9	≥ 1,400	650	1,230	9	<9	<9
SCCS17		3/15/04	11:45		30	<9	<9	≥ 390	340	540	<9	<9	9
SCCS17		3/25/04	9:25		20	<9	<9	≥ 2300	180	660	<9	<9	<9
SCCS17		3/29/04	9:11		9	<9	<9	2,400	430	1,060	<9	<9	<9
SCCS17		4/8/04	10:05	Apr. 1-2	<9	<9	<9	9,000	700	1,390	9	<9	<9
SCCS17		4/15/04	9:42		20	20	9	800	450	1,590	9	<9	<9
SCCS17		4/21/04	9:37	Apr. 17	50	<9	9	1,400	1,340	760	50	<9	9
SCCS17		4/29/04	9:20		40	<9	9	≥ 3,200	730	620	99	9	9
SCCS17		5/5/04	9:34		80	40	30	700	2,200	1,290	60	20	40
SCCS17		5/12/04	9:33		20	9	<9	90	600	2,700	40	9	<9
SCCS17		5/20/04	9:45		30	20	<9	≥ 400	260	500	9	<9	<9
SCCS17		5/27/04	9:48		20	<9	<9	≥ 420	130	310	<9	9	<9
SCCS17		6/3/04	9:50		≥ 40	30	20	90	60	2,500	30	30	<9
SCCS17		6/9/04	9:09		ns	ns	ns	ns	ns	ns	9	<9	<9
SCCS17		6/17/04	9:19		ns	ns	ns	ns	ns	ns	30	<9	<9
SCCS17		6/23/04	9:30		ns	ns	ns	ns	ns	ns	9	<9	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
SCCS52		7/2/03	8:40		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS52		7/9/03	9:16		ns	ns	ns	ns	ns	ns	<10	<10	60
SCCS52		7/16/03	11:08		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS52		7/24/03	10:49		ns	ns	ns	ns	ns	ns	10	<10	<10
SCCS52		7/30/03	8:50	7/30	ns	ns	ns	ns	ns	ns	820	190	460
SCCS52		8/6/03	8:46		ns	ns	ns	ns	ns	ns	<10	<10	30
SCCS52		8/13/03	8:50		ns	ns	ns	ns	ns	ns	20	<10	<10
SCCS52		8/20/03	9:49		ns	ns	ns	ns	ns	ns	30	20	<10
SCCS52		8/25/03	10:23		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS52		9/3/03	8:59		ns	ns	ns	ns	ns	ns	20	<10	<10
SCCS52		9/8/03	10:12		ns	ns	ns	ns	ns	ns	20	<10	<10
SCCS52		9/19/03	9:56		ns	ns	ns	ns	ns	ns	<10	<10	<10
SCCS52		9/22/03	10:29		ns	ns	ns	ns	ns	ns	20	<10	<10
SCCS52		10/1/03	10:46		ns	ns	ns	ns	ns	ns	30	<10	10
SCCS52		10/7/03	10:40		ns	ns	ns	ns	ns	ns	40	<10	180
SCCS52		10/15/03	10:19		ns	ns	ns	ns	ns	ns	40	10	<10
SCCS52		10/23/03	8:53		ns	ns	ns	ns	ns	ns	40	9	<9
SCCS52		10/30/03	9:05		ns	ns	ns	ns	ns	ns	9	9	9
SCCS52		11/13/03	11:19	10/31-11/3	ns	ns	ns	ns	ns	ns	20	20	<9
SCCS52		11/20/03	8:49	11/12, 11/16	ns	ns	ns	ns	ns	ns	50	<9	<9
SCCS52		12/4/03	9:27		ns	ns	ns	ns	ns	ns	50	30	9
SCCS52		12/11/03	9:20	12/11	ns	ns	ns	ns	ns	ns	80	<9	60
SCCS52		12/18/03	8:32		ns	ns	ns	ns	ns	ns	40	<9	<9
SCCS52		12/23/03	8:50		ns	ns	ns	ns	ns	ns	40	<9	<9
SCCS52		12/30/03	9:11	12/25	ns	ns	ns	ns	ns	ns	60	9	40
SCCS52		1/8/04	9:25	Jan. 2-3	9	<9	9	≥ 70	9	40	9	<9	9
SCCS52		1/15/04	9:01		70	<9	30	40	<9	30	40	9	9
SCCS52		1/22/04	10:13		9	9	<9	20	30	<9	360	70	110
SCCS52		1/28/04	9:35		410	130	280	4,600	120	110	270	100	140
SCCS52		2/9/04	9:26	Feb. 2-3	9	<9	<9	40	<9	40	9	<9	<9
SCCS52		2/10/04	9:25		30	20	<9	20	<9	40	40	20	20
SCCS52		3/1/04	9:58	Feb. 18-26	30	<9	20	20	70	190	30	<9	20
SCCS52		3/10/04	9:49	Mar. 1-3	9	9	< 9	40	40	210	30	< 9	9
SCCS52		3/15/04	11:32		<9	<9	<9	250	20	90	<9	<9	<9
SCCS52		3/25/04	9:10		30	<9	20	210	20	30	9	<9	9
SCCS52		3/29/04	9:00		9	<9	<9	160	40	<9	9	<9	<9
SCCS52		4/8/04	10:20	Apr. 1-2	<9	<9	<9	40	<9	70	<9	<9	<9
SCCS52		4/15/04	9:25		9	<9	<9	30	<9	50	9	<9	<9
SCCS52		4/21/04	9:25		20	<9	<9	<9	<9	50	9	<9	<9
SCCS52		4/29/04	9:04		80	20	<9	100	<9	140	40	<9	<9
SCCS52		5/5/04	9:45		50	40	9	<9	9	9	50	30	9
SCCS52		5/12/04	9:15		30	<9	20	<9	<9	<9	40	<9	9
SCCS52		5/20/04	9:34		40	<9	<9	<9	<9	<9	9	9	9
SCCS52		5/27/04	9:30		<9	<9	<9	<9	<9	<9	<9	<9	<9
SCCS52		6/3/04	10:04		ns	ns	ns	ns	ns	ns	≥ 40	40	<9
SCCS52		6/9/04	9:00		ns	ns	ns	ns	ns	ns	9	<9	<9
SCCS52		6/17/04	9:10		ns	ns	ns	ns	ns	ns	20	<9	<9
SCCS52		6/23/04	9:23		ns	ns	ns	ns	ns	ns	20	<9	9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
SCM1	K01	7/3/03	11:03		310	170	90	12000	8800	4400	<10	<10	<10
SCM1	K01	7/10/03	11:02		780	160	380	61000	21000	15500	850	150	270
SCM1	K01	7/17/03	10:36		<10	<10	<10	14200	7150	11600	380	130	260
SCM1	K01	7/25/03	11:45		70	<10	20	13100	1900	6160	140	20	170
SCM1	K01	7/31/03	10:30	7/30	37000	5000	18000	1150	700	60	730	70	60
SCM1	K01	8/7/03	10:59		<10	<10	<10	5300	1000	900	60	<10	10
SCM1	K01	8/14/03	12:15		340	90	90	23000	8000	8100	210	60	50
SCM1	K01	8/18/03	10:50		10	<10	<10	9800	6700	7400	310	120	140
SCM1	K01	8/28/03	10:00		10	<10	<10	5600	930	1290	420	130	90
SCM1	K01	9/5/03	11:30		220	60	30	8300	2600	7900	<10	<10	<10
SCM1	K01	9/11/03	10:22		230	30	40	21000	8400	860	50	10	<10
SCM1	K01	9/15/03	13:23		40	<10	50	115000	21000	3700	880	140	210
SCM1	K01	9/25/03	10:19		160	<10	210	10900	9600	340	<10	<10	<10
SCM1	K01	10/2/03	12:11		60	10	70	29000	3300	32000	240	30	150
SCM1	K01	10/8/03	11:50		10	<10	10	34000	3900	43000	760	130	310
SCM1	K01	10/16/03	12:54		160	110	130	8350	3900	5150	<10	<10	<10
SCM1	K01	10/22/03	10:42		3100	220	490	≥ 35000	4700	9400	≥ 640	80	90
SCM1	K01	10/27/03	11:24		2100	130	270	25000	2100	2700	9	<9	9
SCM1	K01	11/10/03	12:32	10/31-11/3	≥ 5000	300	110	27000	1400	820	230	60	<9
SCM1	K01	11/17/03	11:44	11/12, 11/16	480	40	30	90000	1400	1240	330	9	9
SCM1	K01	12/3/03	11:49		90	60	80	18000	1300	1090	330	20	40
SCM1	K01	12/8/03	11:15	12/7	9	<9	<9	≥ 41000	4400	1920	≥ 6800	520	320
SCM1	K01	12/15/03	11:27	12/14	360	9	40	15000	900	1150	≥ 1000	140	99
SCM1	K01	12/22/03	10:37		≥ 780	60	210	≥ 8900	400	680	480	90	70
SCM1	K01	12/29/03	11:02	12/25	3100	140	140	40000	1500	760	700	<9	20
SCM1	K01	1/6/04	10:50	Jan. 2-3	3,700	190	40	33,000	2,600	440	3,400	300	60
SCM1	K01	1/12/04	10:55		130	70	<9	26,000	2,400	1,220	120	30	9
SCM1	K01	1/20/04	11:22		240	9	9	148,000	4,500	660	7,800	250	99
SCM1	K01	1/26/04	10:44		730	20	30	122,000	1,500	1,210	4,300	40	50
SCM1	K01	2/2/04	12:17		20	20	<9	43,000	2,800	4,300	2,500	170	210
SCM1	K01	2/11/04	12:23	Feb. 2-3	80	<9	9	6,400	50	40	390	30	<9
SCM1	K01	2/17/04	11:41		16,800	22,000	3,300	116,000	900	520	3,800	680	250
SCM1	K01	3/4/04	8:30	Feb. 18-26, Mar. 1-3	2,800	20	90	37,000	390	820	1,100	9	30
SCM1	K01	3/8/04	11:50		2,800	40	40	78,000	1,900	1,360	100	70	480
SCM1	K01	3/18/04	11:00		≥ 960	30	60	≥ 92,000	5,200	2,700	30	<9	<9
SCM1	K01	3/22/04	12:05		5,100	810	140	≥ 81,000	13,500	1,060	4,400	620	80
SCM1	K01	4/1/04	10:50		160	210	70	70,000	41,000	4,900	2,500	1,110	240
SCM1	K01	4/5/04	8:12	Apr. 1-2	9,400	3,500	80	590,000	133,000	5,800	<9	<9	<9
SCM1	K01	4/12/04	10:50		3,200	240	140	38,000	4,700	1,400	610	90	40
SCM1	K01	4/19/04	10:53	Apr. 17	2,800	560	90	58,000	19,000	3,300	9	<9	<9
SCM1	K01	4/27/04	11:00		500	160	170	4,000	2,800	1,190	9	9	<9
SCM1	K01	5/3/04	7:45		40	9	30	22,000	2,300	4,300	670	50	60
SCM1	K01	5/11/04	10:28		70	<9	9	≥ 6,700	2,200	1,410	1,500	480	350
SCM1	K01	5/17/04	10:27		220	50	99	2,000	3,200	3,400	280	50	120
SCM1	K01	5/24/04	10:45		330	70	90	1,400	1,400	1,900	60	9	9
SCM1	K01	6/1/04	8:06		≥ 360	60	140	8,000	2,600	3,300	≥ 300	180	220
SCM1	K01	6/7/04	10:54		50	40	50	5,000	5,700	4,300	510	280	300
SCM1	K01	6/14/04	10:59		420	40	40	≥ 41,000	2,000	2,600	≥ 3,700	260	360
SCM1	K01	6/22/04	10:31		2,100	220	200	51,000	5,900	5,400	2,100	220	260
SCM1	K01	6/28/04	10:28		870	200	110	41,000	4,900	3,900	2,400	220	170

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
SJC1	L01	7/2/03	7:29		420	310	660	6100	2550	6900	270	120	410
SJC1	L01	7/9/03	8:03		<10	<10	60	4150	385	1500	10	<10	<10
SJC1	L01	7/16/03	12:10		<10	<10	<10	<10	<10	<10	10	<10	<10
SJC1	L01	7/24/03	9:43		10	<10	20	1210	310	115	10	<10	<10
SJC1	L01	7/30/03	7:44	7/30	130	<10	370	1570	360	360	190	20	200
SJC1	L01	8/6/03	7:40		30	<10	<10	200	<10	<10	<10	<10	<10
SJC1	L01	8/13/03	7:21		10	<10	10	4700	100	1470	50	10	30
SJC1	L01	8/20/03	8:27		<10	<10	<10	270	30	50	<10	<10	<10
SJC1	L01	8/25/03	9:05		130	40	10	360	130	170	20	<10	20
SJC1	L01	9/3/03	7:28		<10	<10	<10	690	270	30	<10	<10	<10
SJC1	L01	9/8/03	8:45		10	<10	<10	220	190	210	20	<10	10
SJC1	L01	9/19/03	8:35		80	10	<10	4100	430	190	100	80	10
SJC1	L01	9/22/03	9:01		<10	<10	<10	600	280	80	<10	<10	<10
SJC1	L01	10/1/03	9:25		40	10	<10	2700	2100	370	10	<10	<10
SJC1	L01	10/7/03	9:00		20	10	20	1810	660	290	20	<10	<10
SJC1	L01	10/15/03	8:58		360	70	50	8300	3400	2150	6000	360	210
SJC1	L01	10/23/03	7:19		50	20	80	16000	6200	5500	40	30	160
SJC1	L01	10/30/03	7:35		160	30	120	≥ 2200	940	680	310	110	220
SJC1	L01	11/13/03	12:42	10/31-11/3	31000	9900	4500	60000	31000	9700	2400	640	430
SJC1	L01	11/20/03	7:16	11/12, 11/16	540	220	940	52000	28000	48000	940	490	1200
SJC1	L01	12/4/03	8:03		570	160	590	99000	52000	75000	2300	570	2400
SJC1	L01	12/11/03	7:55	12/11	160	60	150	≥ 11400	5200	10000	220	40	250
SJC1	L01	12/18/03	7:25		440	170	590	18000	9100	6500	170	70	220
SJC1	L01	12/23/03	7:10		220	50	220	14000	8700	11800	2900	1370	2400
SJC1	L01	12/30/03	7:34	12/25	4200	2500	12200	22000	13400	24000	360	160	2000
SJC1	L01	1/8/04	7:43	Jan. 2-3	6,900	3,800	6,100	53,000	19,000	40,000	240	90	600
SJC1	L01	1/15/04	7:51		590	430	630	48,000	26,000	36,000	13,600	9,500	11,000
SJC1	L01	1/22/04	8:07		360	200	220	≥ 11,700	3,300	2,300	170	40	100
SJC1	L01	1/28/04	7:45		45,000	10,500	15,200	51,000	10,000	26,000	3,600	560	1,090
SJC1	L01	2/9/04	7:50	Feb. 2-3	120	80	90	9,200	3,800	11,800	680	270	560
SJC1	L01	2/10/04	7:55		320	150	200	142,000	83,000	134,000	4,700	1,140	5,300
SJC1	L01	3/1/04	11:44	Feb. 18-26	1,500	2,900	6,400	1,900	2,600	5,600	290	220	270
SJC1	L01	3/10/04	8:10	Mar. 1-3	950	590	730	36,000	23,000	26,000	2,300	2,100	2,600
SJC1	L01	3/15/04	9:52		140	30	190	13,000	7,900	5,300	4,400	2,200	4,600
SJC1	L01	3/25/04	7:30		340	220	280	≥ 5,500	5,600	8,400	2,400	2,300	3,100
SJC1	L01	3/29/04	7:25		≥ 370	280	270	≥ 2,800	4,100	2,500	1,500	1,030	640
SJC1	L01	4/8/04	12:00	Apr. 1-2	450	520	430	≥ 5,000	6,900	5,200	≥390	280	380
SJC1	L01	4/15/04	7:45		40	40	40	35,000	19,000	14,200	20	<9	20
SJC1	L01	4/21/04	7:55	Apr. 17	750	680	1,060	3,300	3,200	2,500	780	650	680
SJC1	L01	4/29/04	7:38		40	<9	20	≥ 2,000	67,000	10,000	20	<9	20
SJC1	L01	5/5/04	11:20		540	380	240	2,200	4,600	5,700	210	190	420
SJC1	L01	5/12/04	7:40		40	90	500	≥ 6,000	14,300	5,500	120	130	200
SJC1	L01	5/20/04	7:44		700	290	440	1,100	490	660	380	260	290
SJC1	L01	5/27/04	7:45		60	60	60	500	10,000	3,300	99	60	150
SJC1	L01	6/3/04	11:45		50	60	210	7,000	15,000	21,000	9	30	90
SJC1	L01	6/9/04	7:30		9	20	9	14,000	7,500	4,800	20	40	20
SJC1	L01	6/17/04	7:40		60	20	50	3,200	2,300	1,020	200	80	80
SJC1	L01	6/23/04	7:58		9	<9	9	9,000	3,900	6,900	9	<9	20

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
					TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
TRFCYN	MOOP02	7/2/03	9:57		<10	<10	<10	4300	1550	2530	<10	<10	<10
TRFCYN	MOOP02	7/9/03	10:41		<10	<10	<10	9550	3250	5400	<10	<10	<10
TRFCYN	MOOP02	7/16/03	9:53		<10	<10	<10	7950	4400	12500	40	<10	<10
TRFCYN	MOOP02	7/24/03	12:12		<10	<10	<10	9650	4400	860	<10	<10	<10
TRFCYN	MOOP02	7/30/03	10:09	7/30	730	520	520	49000	1000	64000	10	<10	20
TRFCYN	MOOP02	8/6/03	9:49		<10	<10	<10	4300	1600	250	<10	<10	<10
TRFCYN	MOOP02	8/13/03	10:18		<10	<10	<10	20000	3800	1090	40	10	<10
TRFCYN	MOOP02	8/20/03	11:16		<10	<10	<10	3400	1160	940	<10	<10	<10
TRFCYN	MOOP02	8/25/03	11:55		<10	<10	<10	21000	3600	650	<10	<10	<10
TRFCYN	MOOP02	9/3/03	10:24		<10	<10	<10	35000	8100	1170	40	<10	<10
TRFCYN	MOOP02	9/8/03	11:46		10	<10	10	2800	690	720	<10	<10	<10
TRFCYN	MOOP02	9/19/03	11:13		10	<10	<10	4800	730	7300	20	<10	<10
TRFCYN	MOOP02	9/22/03	12:01		<10	<10	<10	4800	2700	250	10	<10	<10
TRFCYN	MOOP02	10/1/03	11:58		<10	<10	10	42000	26000	4100	<10	<10	<10
TRFCYN	MOOP02	10/7/03	11:54		30	10	10	12000	7400	1020	40	10	<10
TRFCYN	MOOP02	10/15/03	11:36		<10	<10	<10	7850	3550	2200	130	10	<10
TRFCYN	MOOP02	10/23/03	10:25		40	20	40	13000	1500	1380	80	<9	40
TRFCYN	MOOP02	10/30/03	10:18		80	60	20	110000	30000	10000	30	9	<9
TRFCYN	MOOP02	11/13/03	9:44	10/31-11/3	40	<9	<9	≥ 44000	3700	3600	20	<9	9
TRFCYN	MOOP02	11/20/03	10:12	11/12, 11/16	260	110	40	106000	10800	880	210	120	30
TRFCYN	MOOP02	12/4/03	10:59		40	9	9	14000	1270	280	30	30	<9
TRFCYN	MOOP02	12/11/03	10:54	12/11	80	40	30	2400000	3400	2000	90	40	50
TRFCYN	MOOP02	12/18/03	9:34		20	30	30	8000	2300	1000	20	<9	9
TRFCYN	MOOP02	12/23/03	10:20	12/23	30	40	<9	≥ 11700	1900	770	<9	<9	<9
TRFCYN	MOOP02	12/30/03	10:54	12/25	110	30	9	≥ 7800	840	230	50	70	40
TRFCYN	MOOP02	1/8/04	10:57	Jan. 2-3	100	30	<9	12,700	390	430	110	9	<9
TRFCYN	MOOP02	1/15/04	10:16		40	60	9	6,100	1,350	2,400	40	40	40
TRFCYN	MOOP02	1/22/04	11:47		30	9	9	3,500	370	310	30	9	30
TRFCYN	MOOP02	1/28/04	11:20		390	60	40	≥ 57,000	5,800	22,000	380	40	60
TRFCYN	MOOP02	2/9/04	10:58	Feb. 2-3	<9	9	<9	2,300	230	600	40	30	<9
TRFCYN	MOOP02	2/10/04	10:45		40	20	<9	≥ 510	150	650	40	<9	<9
TRFCYN	MOOP02	3/1/04	8:30	Feb. 18-26	150	40	60	2,700	780	2,700	99	50	30
TRFCYN	MOOP02	3/10/04	11:10	Mar. 1-3	70	40	9	≥ 2,000	280	310	30	30	9
TRFCYN	MOOP02	3/15/04	12:54		<9	<9	<9	≥ 2,200	290	600	30	<9	9
TRFCYN	MOOP02	3/25/04	10:34		40	9	<9	≥ 3,000	830	560	40	20	20
TRFCYN	MOOP02	3/29/04	10:35		60	30	30	17,000	6,000	250	360	320	40
TRFCYN	MOOP02	4/8/04	8:35	Apr. 1-2	80	40	20	39,000	≥1,700	10,000	150	110	20
TRFCYN	MOOP02	4/15/04	11:20		9	30	<9	17,000	2,400	1,360	20	<9	30
TRFCYN	MOOP02	4/21/04	10:47	Apr. 17	20	30	<9	≥6,100	3,600	1,040	30	30	<9
TRFCYN	MOOP02	4/29/04	10:43		<9	<9	<9	≥ 1,000	2,600	2,800	<9	<9	<9
TRFCYN	MOOP02	5/5/04	8:03		20	9	<9	≥ 400	1,000	3,300	<9	<9	<9
TRFCYN	MOOP02	5/12/04	11:00		20	30	9	3,000	9,600	2,900	20	20	9
TRFCYN	MOOP02	5/20/04	11:04		<9	<9	<9	9,000	3,500	2,400	<9	<9	<9
TRFCYN	MOOP02	5/27/04	11:04		<9	<9	<9	500	630	680	<9	<9	<9
TRFCYN	MOOP02	6/3/04	8:25		<9	20	<9	300	700	570	<9	9	30
TRFCYN	MOOP02	6/9/04	10:24		<9	<9	<9	9,000	1,000	740	<9	9	<9
TRFCYN	MOOP02	6/17/04	10:32		<9	<9	<9	67,000	11,500	520	<9	<9	<9
TRFCYN	MOOP02	6/23/04	10:45		<9	<9	<9	42,000	6,000	900	<9	<9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage Facility	Date	Time	Prior Rainfall	UP COAST (U/C) TC	UP COAST (U/C) FC	UP COAST (U/C) Ent	PIPE / STORM CHANNEL TC	PIPE / STORM CHANNEL FC	PIPE / STORM CHANNEL Ent	DOWN COAST (D/C) TC	DOWN COAST (D/C) FC	DOWN COAST (D/C) Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
VICTRA		7/3/03	8:37		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		7/10/03	8:48		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		7/17/03	8:26		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		7/25/03	9:36		ns	ns	ns	ns	ns	ns	60	<10	<10
VICTRA		7/31/03	8:23	7/30	10	<10	<10	28000	9000	4650	170	<10	<10
VICTRA		8/7/03	8:18		<10	<10	<10	13000	4000	2000	<10	<10	<10
VICTRA		8/14/03	8:55		<10	<10	<10	ns	ns	ns	<10	<10	<10
VICTRA		8/18/03	9:08		<10	<10	<10	ns	ns	ns	<10	<10	<10
VICTRA		8/28/03	7:41		ns	ns	ns	ns	ns	ns	20	<10	<10
VICTRA		9/5/03	9:11		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		9/11/03	8:15		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		9/15/03	11:16		ns	ns	ns	ns	ns	ns	10	<10	20
VICTRA		9/25/03	8:15		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		10/2/03	10:02		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		10/8/03	9:51		ns	ns	ns	ns	ns	ns	10	<10	30
VICTRA		10/16/03	10:35		ns	ns	ns	ns	ns	ns	<10	<10	<10
VICTRA		10/22/03	8:26		ns	ns	ns	ns	ns	ns	<9	<9	<9
VICTRA		10/27/03	9:29		ns	ns	ns	ns	ns	ns	140	120	40
VICTRA		11/10/03	10:21	10/31-11/3	ns	ns	ns	ns	ns	ns	140	20	<9
VICTRA		11/17/03	9:27	11/12, 11/16	40	<9	<9	≥90000	17000	6000	450	9	<9
VICTRA		12/3/03	9:25		ns	ns	ns	ns	ns	ns	90	80	9
VICTRA		12/8/03	8:53	12/7	ns	ns	ns	ns	ns	ns	1800	170	140
VICTRA		12/15/03	9:09	12/14	40	20	<9	≥ 72000	2800	3100	30	<9	<9
VICTRA		12/22/03	8:23		40	30	30	2500000	11600	7500	30	30	30
VICTRA		12/29/03	8:43	12/25	20	9	40	2200000	54000	14300	110	<9	9
VICTRA		1/6/04	8:19	Jan. 2-3	<9	<9	40	2,100,000	50,000	12,400	<9	<9	40
VICTRA		1/12/04	8:40		90	70	<9	≥ 460,000	5,100	4,200	50	40	40
VICTRA		1/20/04	8:50		70	9	<9	840,000	10,000	20,000	9	<9	20
VICTRA		1/26/04	8:30		140	99	40	≥ 140,000	3,800	2,500	160	60	9
VICTRA		2/2/04	9:52		210	90	30	TNTC	21,000	23,000	180	40	<9
VICTRA		2/11/04	9:52	Feb. 2-3	<9	<9	<9	11,500,000	2,100,000	42,000	<9	<9	<9
VICTRA		2/17/04	9:24		40	9	20	173,000	3,100	6,800	40	9	<9
VICTRA		3/4/04	11:00	Feb. 18-26, Mar. 1-3	9	<9	<9	3,700,000	3,300	2,300	30	<9	20
VICTRA		3/8/04	9:55		<9	<9	<9	≥ 100,000	≥ 2,900	7,100	<9	<9	<9
VICTRA		3/18/04	8:45		70	9	40	30,000	1,620	38,000	30	9	<9
VICTRA		3/22/04	9:22		110	20	9	≥ 600,000	22,000	8,900	330	<9	<9
VICTRA		4/1/04	8:40		40	60	20	≥ 2,800,000	19,000	8,600	30	20	20
VICTRA		4/5/04	10:45	Apr. 1-2	40	9	<9	≥ 2,800,000	39,000	36,000	40	<9	<9
VICTRA		4/12/04	8:35		70	9	<9	≥ 220,000	3,900	1,910	30	<9	<9
VICTRA		4/19/04	8:42	Apr. 17	ns	ns	ns	ns	ns	ns	9	<9	<9
VICTRA		4/27/04	8:43		ns	ns	ns	ns	ns	ns	30	9	<9
VICTRA		5/3/04	10:16		ns	ns	ns	ns	ns	ns	30	<9	<9
VICTRA		5/11/04	8:26		ns	ns	ns	ns	ns	ns	9	<9	<9
VICTRA		5/17/04	8:20		ns	ns	ns	ns	ns	ns	30	<9	9
VICTRA		5/24/04	8:30		ns	ns	ns	ns	ns	ns	<9	<9	30
VICTRA		6/1/04	10:30		ns	ns	ns	ns	ns	ns	<9	<9	<9
VICTRA		6/7/04	8:38		ns	ns	ns	ns	ns	ns	9	<9	<9
VICTRA		6/14/04	8:39		ns	ns	ns	ns	ns	ns	9	9	9
VICTRA		6/22/04	8:20		ns	ns	ns	ns	ns	ns	30	9	<9
VICTRA		6/28/04	8:20		ns	ns	ns	ns	ns	ns	20	9	<9

Attachment C-11-V
Coastal Stormdrain Outfall Monitoring Data

Site	Drainage	Date	Time	Prior Rainfall	UP COAST (U/C)			PIPE / STORM CHANNEL			DOWN COAST (D/C)		
	Facility				TC	FC	Ent	TC	FC	Ent	TC	FC	Ent
					CFU/100 ml			CFU/100 ml			CFU/100 ml		
WEST	JOOP02	7/3/03	10:25		10	<10	<10	85	40	30	<10	<10	<10
WEST	JOOP02	7/10/03	10:43		<10	<10	<10	14300	8900	9600	<10	<10	<10
WEST	JOOP02	7/17/03	10:13		<10	<10	<10	3052	645	1640	10	<10	10
WEST	JOOP02	7/25/03	11:17		<10	<10	<10	1210	205	2570	<10	<10	<10
WEST	JOOP02	7/31/03	9:56	7/30	170	30	<10	20600	7100	<10	80	10	<10
WEST	JOOP02	8/7/03	10:12		210	<10	70	1120	710	880	<10	<10	<10
WEST	JOOP02	8/14/03	11:40		<10	<10	<10	1600	630	300	<10	<10	<10
WEST	JOOP02	8/18/03	11:12		<10	<10	<10	3300	370	510	<10	<10	<10
WEST	JOOP02	8/28/03	9:12		ns	ns	ns	5800	120	100	ns	ns	ns
WEST	JOOP02	9/5/03	11:05		<10	<10	<10	490	110	2100	<10	<10	10
WEST	JOOP02	9/11/03	9:56		<10	<10	<10	770	110	210	<10	<10	<10
WEST	JOOP02	9/15/03	12:58		10	<10	<10	570	110	190	30	<10	70
WEST	JOOP02	9/25/03	9:51		<10	<10	<10	250	30	140	<10	<10	<10
WEST	JOOP02	10/2/03	11:44		<10	<10	<10	170	30	210	10	<10	<10
WEST	JOOP02	10/8/03	11:20		10	<10	<10	240	30	170	<10	<10	<10
WEST	JOOP02	10/16/03	12:28		<10	<10	<10	440	160	260	<10	<10	<10
WEST	JOOP02	10/22/03	10:14		<9	<9	<9	≥ 700	9	50	<9	<9	<9
WEST	JOOP02	10/27/03	10:56		9	<9	<9	400	50	80	9	<9	<9
WEST	JOOP02	11/10/03	12:07	10/31-11/3	20	<9	<9	2000	400	140	9	<9	<9
WEST	JOOP02	11/17/03	11:14	11/12, 11/16	140	9	<9	2800	140	90	100	9	<9
WEST	JOOP02	12/3/03	11:20		<9	<9	<9	≥ 120	<9	580	<9	<9	<9
WEST	JOOP02	12/8/03	10:36	12/7	1050	40	50	≥ 1400	≥ 360	1750	940	80	50
WEST	JOOP02	12/15/03	10:52	12/14	<9	<9	<9	≥ 5100	110	290	<9	<9	<9
WEST	JOOP02	12/22/03	10:13		≥ 100	9	310	2600	60	230	<9	<9	<9
WEST	JOOP02	12/29/03	10:35	12/25	<9	<9	<9	4200	510	330	<9	<9	<9
WEST	JOOP02	1/6/04	10:20	Jan. 2-3	<9	<9	<9	≥ 240	90	80	<9	<9	<9
WEST	JOOP02	1/12/04	10:32		9	9	<9	≥ 200	20	<9	<9	9	<9
WEST	JOOP02	1/20/04	11:03		<9	9	<9	≥ 550	9	70	<9	<9	<9
WEST	JOOP02	1/26/04	10:20		<9	<9	<9	1,700	20	120	40	9	<9
WEST	JOOP02	2/2/04	11:49		<9	<9	<9	330	<9	140	9	<9	<9
WEST	JOOP02	2/11/04	11:54	Feb. 2-3	<9	20	<9	≥ 210	<9	1,730	9	9	<9
WEST	JOOP02	2/17/04	11:13		9	<9	30	≥ 320	9	1,320	40	9	9
WEST	JOOP02	3/4/04	8:52	Feb. 18-26, Mar. 1-3	20	<9	<9	80	20	40	30	<9	<9
WEST	JOOP02	3/8/04	11:30		<9	<9	<9	≥ 40	<9	100	<9	<9	<9
WEST	JOOP02	3/18/04	10:40		<9	<9	<9	1,000	710	4,800	<9	<9	<9
WEST	JOOP02	3/22/04	11:38		<9	<9	<9	40	<9	30	<9	<9	<9
WEST	JOOP02	4/1/04	10:28		<9	<9	<9	<9	50	400	<9	<9	<9
WEST	JOOP02	4/5/04	8:40	Apr. 1-2	<9	<9	9	≥ 190	<9	20	9	<9	20
WEST	JOOP02	4/12/04	10:25		<9	<9	<9	30	20	20	<9	<9	<9
WEST	JOOP02	4/19/04	10:25	Apr. 17	20	<9	<9	≥200	40	50	30	<9	<9
WEST	JOOP02	4/27/04	10:37		9	<9	<9	170	<9	9	30	9	<9
WEST	JOOP02	5/3/04	8:10		<9	<9	<9	1,600	2,400	1,540	<9	9	<9
WEST	JOOP02	5/11/04	10:03		<9	<9	<9	20	40	300	<9	<9	<9
WEST	JOOP02	5/17/04	10:02		<9	<9	<9	≥ 40	60	60	<9	<9	<9
WEST	JOOP02	5/24/04	10:24		<9	<9	<9	1,300	40	90	<9	<9	<9
WEST	JOOP02	6/1/04	8:32		40	40	30	90	<9	50	<9	<9	<9
WEST	JOOP02	6/7/04	10:30		9	<9	<9	300	130	20	<9	<9	<9
WEST	JOOP02	6/14/04	10:30		<9	<9	<9	≥ 890	20	220	<9	<9	<9
WEST	JOOP02	6/22/04	10:06		9	<9	<9	≥ 500	80	210	<9	<9	9
WEST	JOOP02	6/28/04	10:04		20	9	9	2,200	9	90	30	<9	<9

Attachment C-11-VI

Dry Weather Reconnaissance Sampling Data

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals: Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
AVJ01P26	6/17/03 12:10	0.010	7.66	1055	8.53	18.91	4.29	23.5	<0.02	0.21	6.2	0.2	2.73	0.04	<5.0	<5.0	24000	9000	17600	<5.0	<5.0	<5.0	<5.0		<8.0	6.6	49	110	<2.0	<1.0	<2.0	240
AVJ01P26	8/7/03 13:00	0.118	7.92	889	7.50	21.96	12.2	33.0	<0.02	1.47	3.9	0.4	2.88	0.15	15	<5.0	41000	21000	5100	<5.0	<5.0	<5.0	<5.0		<8.0	4.7	7.3	230	<2.0	<1.0	<2.0	185
AVJ01P26	8/26/03 12:25	0.023	9.73	1237	7.52	28.21	2.79	34.0	<0.02	0.56	8.3	0.3	2.98	0.07	<5.0	<5.0	30000	21000	45000	<5.0	<5.0	<5.0	<5.0		<8.0	5.4	11	22	<2.0	<1.0	<2.0	264
AVJ01P26	5/11/04 9:30	0.012	4.3	963	8.30	18.40	2.8	30	<0.02	<0.01	2.8	<0.05	1.11	0.1	12	<5	10300	8200	8400	<5	<5	<5	<5	<10	<8.0	<4	13	45	<2.0	<1.0	<2.0	312
AVJ01P26	7/22/04 9:30	0.070	8.04	1204	7.91	21.97	6.02	28	<0.02	1.59	2.9	<0.05	2.55	0.07	10	<5	44000	19400	18400	48.7	<5	<5	<5	<10	<8.0	5.6	8.3	44	<2.0	<1.0	<2.0	320
AVJ01P26	8/25/04 9:30	0.020	7.76	908	7.72	20.32	9.24	24	<0.02	0.23	2.7	<0.05	1.88	<0.01	27	<5	67000	46000	32000	22.8	<5	3170	<5	<10	<8.0	32	39	140	<2.0	1.4	7.5	246
AVJ01P27	7/16/03 11:30	0.092	10.67	1938	7.85	22.86	23.7	34.0	<0.02	0.99	7.6	0.3	4.03	0.04	<5.0	<5.0				<5.0	<5.0	<5.0	<5.0		<8.0	8.5	7.4	55	<2.0	1.8	<2.0	440
AVJ01P27	8/11/03 8:30	0.145	8.55	1643	8.08	21.46	12.4	29.0	<0.02	0.47	6.0	0.1	3.15	0.03	18	<5.0	89000	67000	36000	<5.0	<5.0	<5.0	414		<8.0	6.2	14	50	<2.0	1.8	<2.0	396
AVJ01P27	8/26/03 9:45	0.120	7.38	1690	6.97	22.09	7.72	29.0	<0.02	0.32	8.5	0.15	3.14	0.01	9	<5.0	88000	31000	71000	1110	<5.0	<5.0	<5.0		<8.0	6	7.7	46	<2.0	1.5	<2.0	480
AVJ01P27	9/10/03 8:43	0.156	8.65	1761	7.68	20.86	14.3	21.0	<0.02	0.21	1.5	0.12	0.58	0.07	6	<5.0	107000	48000	8600	<5.0	<5.0	<5.0	<5.0		<8.0	6.9	8.5	44	<2.0	1.5	<2.0	520
AVJ01P27	9/16/03 8:51	0.182	4.73	1644	7.66	21.21	11.5	21.2	<0.02	<0.01	1.9	3.34	2.5	0.02	10	<5.0	80000	31000	33000	<5.0	<5.0	<5.0	<5.0		<8.0	7	10	130	<2.0	1.5	<2.0	544
AVJ01P27	6/18/04 10:20	0.224	7.6	1956	7.70	20.30	10.8	21	<0.02	0.4	0.6	<0.05	0.05	<0.01	20	0.6	147000	104000	128000	<5	<5	<5	<5	<10	<8.0	11	27	91	<2.0	<1.0	<2.0	620
AVJ01P27	7/22/04 11:15	0.189	6.88	1976	7.55	22.31	11.2	30	<0.02	2.22	5.6	<0.05	2.12	0.1	6	<5	>200000	>200000	50000	283	<5	<5	<5	<10	<8.0	19	40	130	<2.0	2.1	<2.0	616
AVJ01P27	8/25/04 10:45	0.176	6.94	1772	7.51	21.46	18.7	28	<0.02	1.33	8.8	<0.05	3.87	0.06	24	<5	54000	44000	31000	372	<5	<5	<5	<10	<8.0	5.2	7.9	47	<2.0	<1.0	<2.0	556
AVJ01P27	9/22/04 13:30	0.108	12.2	1679	7.50	22.71	10.6	33	<0.02	0.37	5.1	<0.05	1.31	0.03	8	<5	53000	36000	12600	<5	<5	103	<5	<10	<8.0	29	39	130	<2.0	1.5	5.3	560
AVJ01P27	9/28/04 9:14	0.302	7.05	1736	8.27	20.81	7.03		<0.02	0.94	5.8	0.05	2.34	0.02	20	<5	148000	69000	13200	<5	<5	<5	<5	<10	<8.0	28	38	74	<2.0	<1.0	<2.0	625
AVJ01P28	7/16/03 12:45	0.094	5.14	1252	7.89	23.22	22.3	32.0	<0.02	1.8	4.6	0.6	3.54	0.03	<5.0	<5.0				<5.0	<5.0	<5.0	<5.0		<8.0	9.1	9.8	79	<2.0	<1.0	<2.0	286
AVJ01P28	8/12/03 9:45	n/a	7.22	1263	7.97	21.42	7.98	34.0	<0.02	1.51	6.5	0.5	4.3	0.05	8	<5.0	83000	26000	6600	<5.0	<5.0	<5.0	1450		<8.0	7.7	19	78	<2.0	<1.0	<2.0	298
AVJ01P28	8/26/03 11:00	n/a	8.10	1322	7.11	22.40	9.69	30.0	<0.02	2.37	8.4	0.35	3.81	0.03	10	<5.0	94000	44000	52000	139	<5.0	<5.0	<5.0		<8.0	6.8	8.8	44	<2.0	<1.0	<2.0	400
AVJ01P28	9/10/03 9:28	n/a	10.70	1370	7.89	20.44	24.2	22.0	<0.02	1.78	2.0	0.26	0.87	0.13	15	<5.0	119000	31000	23000	<5.0	<5.0	<5.0	<5.0		<8.0	9.5	13	54	<2.0	<1.0	<2.0	384
AVJ01P28	9/16/03 9:39	0.165	4.76	1358	7.98	20.96	15.3	26.5	<0.02	<0.01	2.2	0.5	1.12	0.12	23	<5.0	101000	33000	26000	<5.0	<5.0	<5.0	<5.0		<8.0	7.8	9.5	49	<2.0	<1.0	<2.0	362
AVJ01P28	6/18/04 0:00																															
AVJ01P28	7/13/04 13:30	0.036	3.06	1486	7.37	21.78		28	<0.02	1.99	5.8	0.65	3.29	0.06	23	<5	181000	104000	48000	159	<5	<5	<5	<10	<8	11	12	140	<2.0	<1.0	<2.0	390
AVJ01P28	7/22/04 12:00	0.100	3.95	1438	7.56	23.08	11.1	30	<0.02	5.1	5.4	0.4	5.34	0.05	11	<5	>200000	>200000	36000	124	<5	84.3	<5	<10	<8	8.9	10	95	<2.0	<1.0	<2.0	334
AVJ01P28	8/25/04 0:00	RAIN																														
AVJ01P28	9/9/04 9:04	0.048	8.63	1397	7.78	22.51	20.7		<0.02	0.25	7.4	0.07	5.16	0.09	30	<5	>200000	76000	>200000	63.4	<5	145	<5	<10	<8	10	6.5	55	<2.0	<1.0	<2.0	435
AVJ01P28	9/22/04 2:00	0.044	7.05	1215	8.15	23.14	67.6	34	<0.02	1.27	6	0.2	3.44	<0.01	100	<5	>200000	>200000	44000	<5	<5	<5	<5	<10	<8	23	58	98	<2.0	<1.0	<2.0	376
AVJ01P28	9/28/04 8:43	900	5.09	1314	8.32	20.44	27		<0.02	0.18	7.3	0.26	4.84	0.02	40	<5	>200000	>200000	54000	48.2	<5	<5	<5	<10	<8	9.9	17	52	<2.0	<1.0	<2.0	295
AVJ01P33	6/17/03 10:59	0.006	10.30	2265	7.97	18.78	1.49	27.3	<0.02	0.07	2.4	<0.05	2	0.03	<5.0	<5.0	11000	3000	6100	<5.0	<5.0	<5.0	<5.0		<8.0	6.1	3	15	<2.0	<1.0	<2.0	416
AVJ01P33	8/7/03 11:45	0.400	7.17	2135	7.48	22.32	260	36.0	<0.02	6.44	4.4	<0.05	9.84	0.07	212	<5.0	151000	71000	72000	<5.0	<5.0	<5.0	<5.0		<8.0	14	11	39	<2.0	1.5	<2.0	436
AVJ01P33	8/26/03 10:35	0.003	8.65	1493	7.33	22.95	1.81	30.0	<0.02	0.08	3.8	<0.05	1.86	0.03	6	<5.0	37000	14600	9700	97	<5.0	<5.0	<5.0		<8.0	4.2	3.3	17	<2.0	<1.0	<2.0	440
AVJ01P33	5/11/04 11:00	0.006	10.2	1417	7.70	19.40	7.34	31	<0.02	<0.01	2.6	<0.05	1.97	0.02	12	<5	7900	1240	1630	685	<5	<5	<5	<10	<8	9.1	6.8	69	<2.0	<1.0	<2.0	410
AVJ01P33	7/22/04 10:15	0.009	8.22	2420	8.38	22.73	17.2	28	<0.02	0.11	8.3	1.4	2.59	0.01	33	<5	199000	177000	29000	104	<5	<5	<5	<10	<8	9.2	15	160	<2.0	<1.0	2.40	562
AVJ01P33	8/25/04 10:15	0.006	10.23	2302	8.47	20.02	1.85	28	<0.02	0.06	2.3	<0.05	2.17	0.03	<5	<5	86000	67000	123000	20.1	<5	<5	<5	<10	<8	11	8	27	<2.0	<1.0	<2.0	696
AVJ02P05	6/27/03 13:27	0.034	9.21	1180	8.17	21.10	3.35	32.0	<0.02	0.51	2.1	0.15	0.96	0.04	<5.0	8	17650	6850	20600	<5.0	<5.0	<5.0	<5.0		<8.0	6.2	50	120	<2.0	<1.0	3.4	168
AVJ02P05	8/7/03 10:16	0.074	9.20	1081	7.57	20.99	15.7	31.0	<0.02	1.52	9.1	<0.05	4.2	0.07	23	<5.0	82000	17000	33000	<5.0	<5.0	<5.0	<5.0		<8.0	5.6	11	42	<2.0	<1.0	<2.0	206
AVJ02P05	8/28/03 9:30	0.162	9.22	1081	7.54	23.05	9.45	29.0	<0.02	0.55	4.2	0.65	1.17	0.11	20	<5.0	92000	31000	38000	<5.0	<5.0	<5.0	189		<8.0	<4.0	22	21	<2.0	<1.0	<2.0	372
AVJ02P05	7/13/04 12:15	0.029	9.18	2397	8.23	21.41	2.49	27	<0.02	0.05	7.2	0.03	1.64	0.03	<5	<5	38000	15800	12800	145	<5	<5	<5	<10	<8.0	9.9	13	53	<2.0	<1.0	<2.0	744
AVJ02P05	7/26/04 9:30	0.095	8.52	2013	8.20	21.60	28.2	23	<0.02	1.14	7.8	0.2	3.75	0.06	57	<5	200000	124000	166000	50.5	<5	31.4	<5	<10	<8.0	8.8	14	67	<2.0	3.0	<2.0	408
AVJ02P05	9/9/04 11:07	0.128	9.02	2160	7.92	23.54	6.46		<0.02	0.27	10.6	0.08	4.82	0.1	7	<5	200000	>200000	164000	50.4	<5	<5	<5	<10	<8.0	12	8.6	40	<2.0	<1.0	<2.0	538
COH04S01	6/19/03 8:45	0.100	8.24	8020	7.46	17.17	3.44	20.0	<0.02	0.08	0.4	0.1	0.55	<0.01	<5.0	<5.0	1250	900	560	<5.0	<5.0	<5.0	<5.0		<8.0	29	<2.0	34	<2.0	<1.0	<2.0	1092
COH04S01	8/18/03 9:15	0.120	7.87	5270	6.99	18.60	1.27	26.0	<0.02	<0.01	1.0	0.05	<0.01	0.02	<5.0	<5.0	2600	1470	390	<5.0	<5.0	<5.0	<5.0		<8.0	10	<2.0	21	<2.0	<1.0	<2.0	976
COH04S01	8/28/03 13:15	0.050	9.00	5318	7.20	21.90	2.16	29.0	<0.02	0.08	0.1	0.05	0.8	0.08	<5.0	<5.0	4800	1100	6050	<5.0	<5.0	<5.0	<5.0		<8.0	12	<2.0	17	<2.0	<1.0	<2.0	
COH04S01	5/13/04 11:15	0.250	9.76	7960	7.97	18.40	2.37	25	<0.02	<0.01	0.8	0.1	0.89	0.04						<5	<5	<5	<5	<10	<8.0	23	2	36	<2.0	3.0	<2.0	1300
COH04S01	8/5/04 11:00	0.050	8.07	4519	7.64	19.64	3.77		<0.02	0.05	0.4	<0.05	0.93	0.05	8	<5	8450	4700	2500	<5	<5	<5	<5	<10	<8.0	20	7.2	30	<2.0	<1.0	<2.0	1926
COH04S01	9/8/04 12:15	0.100	9.04	4175	7.51	21.20	3.84		<0.02		0.6	<0.05	1.19	0.05	20	<5	4700	3100	580	<5	<5	<5	<5	<10	<8.0	27	<2	46	<2.0	<1.0	<2.0	1910

																									Dissolved Metals							
Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
COL02P25	6/25/03 10:00	1.350	8.94	1562	8.19	18.86	2.70	24.0	<0.02	0.02	1.5	0.2	1.42	<0.01	<5.0	<5.0	8200	4700	7050	125	<5.0	<5.0	<5.0		<8.0	<4.0	9.3	27	<2.0	<1.0	<2.0	498
COL02P25	8/15/03 8:45	0.170	9.29	1427	7.28	21.70	6.87	26.0	<0.02	0.02	1.9	0.05	1.31	0.04	7	<5.0	37000	7850	1900	222	<5.0	<5.0	<5.0		<8.0	<4.0	3.3	35	<2.0	<1.0	<2.0	412
COL02P25	9/9/03 12:45	0.300	9.57	1453	7.95	21.31	3.47	24.0	<0.02	0.068	1.4	0.07	0.35	<0.01	9	<5.0	36000	22000	66000	137	<5.0	<5.0	<5.0		<8.0	<4.0	4.5	23	<2.0	<1.0	<2.0	740
COL02P25	6/15/04 10:20	0.112	9.26	1209	8.00	19.40	2.98	22	<0.02	0.09	0	0.01	0.55	0.03	<5	<5	34000	27000	11000	289	<5	66.2	<5	<10	<8.0	<4	4.2	43	<2.0	<1.0	<2.0	390
COL02P25	8/16/04 10:13	0.260	9.51	1150	7.94	21.92	2.89	27	<0.02	0.8	1.5	<0.05	1.43	0.13	6	<5	42000	19800	21000	18.9	<5	82.7	<5	<10	<8.0	5.2	6.5	32	<2.0	<3.0	<2.0	346
COL02P25	9/13/04 9:18	0.450	8.38	881	7.93	22.30	1.75		<0.02	0.68	0.9	<0.05	0.74	0.04	<5	<5	31000	21000	10600	95.4	<5	16.9	<5	<10						3		320
COL02P29	8/5/03 10:00	0.001	7.86	1606	7.63	23.68	3.45	29.5	<0.02	0.04	6.3	0.2	1.78	0.02	<5.0	<5.0	16000	7000	5550	334	<5.0	<5.0	<5.0		<8.0	<4.0	14	25	<2.0	<1.0	<2.0	438
COL02P29	8/22/03 9:00	DRY																														
COL02P29	9/9/03 10:45	DRY																														
COL02P29	6/15/04 0:00	DRY																														
COL02P29	8/16/04 0:00	DRY																														
COL02P45	6/25/03 11:45	0.032	7.74	1223	8.26	18.87	7.81	32.0	<0.02	0.11	3.5	0.05	1.33	0.06	50	<5.0	9550	8300	5500	988	<5.0	<5.0	<5.0		<8.0	<4.0	10	36	<2.0	<1.0	<2.0	290
COL02P45	8/15/03 13:15	0.016	7.18	1087	6.90	22.48	4.17	36.0	<0.02	<0.01	4.5	0.05	0.36	0.05	5	<5.0	2900	2700	6550	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	4.2	22	<2.0	<1.0	<2.0	368
COL02P45	9/9/03 10:32	0.045	7.84	953	8.10	20.80	2.85	23.0	<0.02	0.19	1.0	0.1	0.33	0.04	<5.0	<5.0	26000	14600	8100	1190	<5.0	<5.0	171		<8.0	<4.0	4.9	27	<2.0	<1.0	<2.0	286
COL02P45	6/15/04 13:30	0.010	7.17	1246	7.90	20.80	1.74	24	<0.02	0.38	1.7	<0.05	0.96	0.08	<5	<5	38000	23000	10600	551	<5	91.3	<5	<10	<8.0	<4	4.3	34	<2.0	<1.0	<2.0	360
COL02P45	8/16/04 14:00	0.010	9.15	1528	8.13	22.67	3.56		<0.02	0.06	2.9	0.05	1.72	0.09	5	<5	7800	6300	6600	40.3	<5	<5	<5	<10	<8.0	6.1	7.3	37	<2.0	<3.0	<2.0	430
COL02P45	9/13/04 11:35	0.022	9.53	1177	7.97	24.56	2.91		<0.02	0.06	2.7	<0.05	1.28	0.08	<5	<5	10600	7300	5600	498	<5	<5	<5	<10								454
COL02P50	7/15/03 12:47	0.086	8.86	1893	7.91	19.42	2.66	32.0	<0.02	0.06	0.9	<0.05	2.24	0.02	<5.0	<5.0	4350	3100	2400	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2.8	55	<2.0	<1.0	<2.0	520
COL02P50	8/20/03 11:00	0.137	6.92	1830	7.50	20.20	2.24	30.0	<0.02	0.08	1.1	<0.05	2.22	0.03	<5.0	<5.0	620	130	280	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	<2.0	18	<2.0	<1.0	<2.0	568
COL02P50	9/9/03 9:30	0.840	6.93	1900	7.07	18.17	7.38	27.0	<0.02	0.02	1.2	0.05	2.54	0.01	<5.0	<5.0	1490	130	870	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	4.8	27	<2.0	<1.0	<2.0	988
COL02P50	6/21/04 9:30	0.189	8.84	2075	7.55	17.30	1.02	21	<0.02	<0.01	1.1	0.13	1.48	0.01	<5	<5	530	380	590	63.7	<5	<5	<5	<10	<8.0	5	<2.0	71	<2.0	<1.0	<2.0	762
COL02P50	7/29/04 12:30	0.018	8.5	3423	7.82	21.80	10.6		<0.02	0.09	4	0.1	1.24	0.02	20	<5	16400	6300	11100	<5	<5	<5	<5	<10	<8.0	280	8.9	120	<2.0	88	<2.0	1364
COL02P50	9/9/04 9:45	0.036	12.2	1625	7.40	22.40	11.8	28	<0.02	0.03	3.3	0.2	1.8	0.03	26	<5	>200000	77000	135000	66.6	<5	<5	<5	<10	<8.0	130	6.8	97	<2.0	35	<2.0	784
COL02P50	9/13/04 12:54	0.288	8.91	1734	7.31	19.67	0.89		<0.02	<0.01	1.1	<0.05	2.76	0.05	<5	<5	6300	4200	3100	12.8	<5	<5	<5	<10								796
COL02P55	7/15/03 14:00	0.180	7.38	1676	8.09	28.62	3.98	32.0	<0.02	0.07	1.7	<0.05	0.86	0.08	7	<5.0	27000	18000	13000	<5.0	<5.0	<5.0	<5.0		<8.0	61	4.1	33	<2.0	16	<2.0	540
COL02P55	8/20/03 12:30	0.018	6.86	3100	8.20	21.40	8.05	36.0	<0.02	0.06	5.2	<0.05	1.15	0.04	14	<5.0	18700	3600	5800	94	<5.0	<5.0	<5.0		<8.0	230	5.9	75	<2.0	75	<2.0	690
COL02P55	9/9/03 11:00	0.010	7.52	3260	7.42	20.29	4.92	29.0	<0.02	0.14	6.0	<0.05	0.4	0.05	25	<5.0	6800	4100	5400	<5.0	<5.0	<5.0	<5.0		<8.0	290	4.3	87	<2.0	110	<2.0	1452
COL02P55	6/21/04 10:30	0.054	9.59	2305	7.95	18.74	15.9	21	<0.02	0.08	3.9	0.03	2.13	<0.01	12	<5	16800	3900	10400	<5	<5	<5	<5	<10	<8.0	210	5.2	120	<2.0	68	<2.0	1160
COL02P55	7/29/04 11:45	0.126	8.36	2180	7.60	20.03	0.91		<0.02	<0.01	0.5	0.08	1.43	0.11	<5	<5	1140	630	620	43.1	<5	<5	<5	<10	<8.0	6.6	3.2	35	<2.0	<1.0	<2.0	776
COL02P55	9/9/04 0:00		DRY																						<8.0	130	6.8	97	<2.0	35	<2.0	
COL11P01	7/31/03 12:30	0.225	10.08	1199	7.98	22.98	11.10	34.0	<0.02	0.49	2.6	1.9	2.61	0.11	8	<5.0	198000	145000	8250	63	<5.0	<5.0	<5.0		<8.0	<4.0	15	88	<2.0	<1.0	<2.0	172
COL11P01	8/20/03 10:20	0.056	7.01	1192	8.90	22.40	3.42	26.0	<0.02	0.33	2.9	0.55	1.61	0.03	<5.0	<5.0	43000	7300	6600	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	10	30	<2.0	<1.0	<2.0	336
COL11P01	9/10/03 10:30	0.055	8.17	828	8.18	20.98	3.16	28.0	<0.02	0.17	1.6	<0.05	0.88	0.03	<5.0	<5.0	15600	8100	3300	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	3.9	21	<2.0	<1.0	<2.0	590
COL11P01	9/16/03 9:30	0.043	8.05	936	8.23	21.22	6.40	22.0	<0.02	0.13	2.0	<0.05	1.28	<0.01	<5.0	<5.0	42000	12100	53000	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	6.3	18	<2.0	<1.0	<2.0	642
COL11P01	9/19/03 11:00	0.054	8.83	1242	8.33	21.35	2.32	28.0	<0.02	0.08	2.0	0.1	1.19	0.04	<5.0	<5.0	8600	2800	4000	72	<5.0	<5.0	<5.0		<8.0	<4.0	4.3	17	<2.0	<1.0	<2.0	
COL11P01	6/21/04 11:30	0.065	9.42	1055	8.27	18.83	4.09	28	<0.02	0.14	3.4	0.4	2.18	0.04	<5	<5	16600	9500	9950	56.3	32.1	47.1	<5	<10	<8.0	6.1	10	100	<2.0	<1.0	<2.0	390
COL11P01	7/29/04 10:45	0.054	9.28	1203	8.26	20.81	5.72		<0.02	0.09	4.4	0.1	1.6	0.03	7	<5	36000	9650	33000	35.8	10.4	<5	<5	<10	<8.0	<4	7.7	30	<2.0	<1.0	<2.0	342
COL11P01	9/9/04 13:00	0.042	14.5	1319	7.40	23.20	5.16	30	<0.02	0.03	1.4	0.1	1.3	0.08	10	<5	18100	9950	26000	118	<5	<5	<5	<10	<8.0	6.5	5.9	19	<2.0	<1.0	<2.0	434
COL11P01	9/22/04 10:00	0.144	13.68	944	8.15	22.40	1000	28	<0.02			0.1	1.27	0.15	120	<5	65000	34000	11900	<5	<5	<5	<5	<10	<8.0	<4	13	220	<2.0	3.0	<2.0	310
COL11P01	9/29/04 9:15	0.096	13.54	1515	8.42	19.99	2.5		<0.02	0.51	5.3	<0.05	1.27	0.05	<5	<5	43000	16600	15600	7.9	<5	<5	<5	<10	<8.0	<4	8.1	44	<2.0	<1.0	<2.0	354
COL11P02	7/31/03 11:30	0.480	10.53	1036	7.96	23.59	8.80	33.5	<0.02	0.19	2.4	0.9	1.44	0.05	44	<5.0	26400	10600	11300	555	<5.0	<5.0	<5.0		<8.0	<4.0	26	58	<2.0	<1.0	<2.0	180
COL11P02	8/20/03 9:30	0.132	8.10	1038	8.50	22.10	3.59	26.0	<0.02	0.94	<0.1	<0.05	2.65	0.02	<5.0	<5.0	16300	7400	9900	2600	<5.0	<5.0	<5.0		<8.0	<4.0	9	42	<2.0	<1.0	<2.0	298
COL11P02	9/10/03 9:00	0.158	19.01	800	8.24	20.79	8.75	25.0	<0.02	0.22	2.0	0.05	1.73	0.03	12	<5.0	41000	25000	33000	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	8.2	22	<2.0	<1.0	<2.0	415
COL11P02	5/5/04 0:00	0	8.36	1054	8.23	18.98	2.13	28	<0.02	0.33	2.9	0.08	1.44	0.06	<5	<5	80000	2800	77000	271	<5	<5	<5	53.5	<8.0	<4	9.3	35	<2.0	<1.0	<2.0	
COL11P02	7/29/04 9:45	0.108	8.37	1159	8.04	21.20	5.22		<0.02	0.3	2.8	0.15	1.4	0.01	10	<5	42000	7900	28000	258	<5	47.6	<5	<10	<8.0	<4	7.1	26	<2.0	<1.0	<2.0	290
COL11P02	9/9/04 0:00	0.074	12	932	7.80	23.70	5.4	30	<0.02	0.29	2.2	0.1	1.59	0.05	<5	<5	114000	45000	116000	17.8	<5	<5	<5	<10	<8.0	5.5	7.6	39	<2.0	<3.0	<2.0	272

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals: Chromium	Dissolved Metals: Nickel	Dissolved Metals: Copper	Dissolved Metals: Zinc	Dissolved Metals: Silver	Dissolved Metals: Cadmium	Dissolved Metals: Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^{0}C	NTU	^{0}C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100mL	CFU/100mL	CFU/100mL	ng/L	ng/L	ng/L	ng/L	ng/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
COM02XXX	6/23/03 9:25	0.041	10.54	7555	7.89	16.89	7.82	17.9	<0.02	<0.01	6.7	<0.05	0.3	0.1	37	<5.0	16000	2850	12650	<5.0	<5.0	<5.0	<5.0		<8.0	760	<2.0	130	<2.0	54	<2.0	6900
COM02XXX	8/18/03 10:00	DRY																														
COM02XXX	9/8/03 9:18	0.248	8.87	1186	8.10	23.05	403	25.0	<0.02		1.3	0.45	0.18	0.38	555	<5.0	3800	3100	1760	<5.0	<5.0	<5.0	<5.0		120	9.8	9.6	50	<2.0	<1.0	<2.0	434
COM02XXX	7/15/04 11:30	0.048	9.33	835	8.27	19.12	13.5	34	<0.02	0.07	0.7	0.1	1.56	0.03	35	<5	12000	6100	3900	<5	<5	<5	<5	<10	<8.0	14	7.4	160	<2.0	<3.0	<2.0	808
COM02XXX	8/13/04 9:30	0	7.02	2165	7.38	20.90	3.44		<0.02	0.37	3.1	1.5	2.49	0.12	7	<5	77000	67000	4700	20.3	<5	24.1	<5	<10	<8.0	25	13	54	<2.0	5.4	<2.0	700
COM02XXX	9/8/04 0:00																															
COM02XXX	9/16/04 11:16	0.059	9.14	823	8.10	19.53	62.1		<0.02	<0.01	1.5	<0.05	2.33	0.07	70	<5	111000	85000	17200	<5	<5	<5	<5	<10	<8.0	12	7.8	<10	<2.0	<1.0	<2.0	600
DP@BR	7/18/03 0:00	DRY																														
DP@BR	8/18/03 0:00	DRY																														
DP@BR	9/4/03 0:00	DRY																														
DP@BR	9/11/03 0:00	DRY																														
DP@BR	9/17/03 0:00	DRY																														
DP@BR	7/9/04 10:15	0	11.27	7236	8.51	26.84	3.46	26	<0.02	0.05	0.9	0.05	0.11	0.03	36	<5	2600	1830	400	<5	<5	<5	<5	<10	<8.0	8.1	6.4	24	<2.0	<1.0	<2.0	1604
DP@BR	8/12/04 9:50	0	4.52	9519	7.96	22.40	5.07	22		0.08	0.8	0.18	0.45	0.01	20	<5	180	80	40	<5	<5	<5	<5	<10	<8.0	8.7	4.1	30	<2.0	<3.0	<2.0	1916
DP@BR	9/2/04 9:30	0	6.04	7847	8.08	22.59	3.56		<0.02	0.06	0.5	<0.05	0.23	0.01	13	<5	7600	6500	270	<5	<5	<5	<5	<10	<8.0	10	5.9	33	<2.0	<1.0	<2.0	1818
DP@BR	9/16/04 10:26	0	8.6	4410	8.02	23.58	2.84		<0.02	0.17	1	0.09	0.53	0.08	13	<5	4400	2300	1960	<5	<5	<5	<5	<10	<8.0	8.9	2.2	<10	<2.0	<1.0	<2.0	1815
DP@BR	9/28/04 11:17	0	10.54	9760	8.29	24.04	6.66		<0.02	0.11	1.6	0.13	0.27	0.13	60	<5	15000	9550	4100	<5	<5	<5	<5	<10	<8.0	9.1	4.7	<10	<2.0	<1.0	<2.0	1860
DP@DPR	9/16/04 9:23	DRY																														
DP@DPR	9/28/04 10:17	DRY																														
DP@SA	7/18/03 12:00	DRY																														
DP@SA	8/18/03 10:45	DRY																														
DP@SA	9/4/03 10:30	n/a	6.74	865	7.25	20.71	24.8	28.0	<0.02	1.54	1.2	0.1	5.46	0.04	31	<5.0	93000	72000	81000	<5.0	<5.0	<5.0	<5.0		<8.0	9.5	26	100	<2.0	<1.0	<2.0	260
DP@SA	9/11/03 9:15	n/a	7.92	627	7.71	20.49	30.3	27.0	<0.02	0.91	1.4	0.15	3.84	0.01	50	<5.0	166000	51000	28000	<5.0	<5.0	<5.0	<5.0		<8.0	6.3	6.9	40	<2.0	<1.0	<2.0	474
DP@SA	9/18/03 12:56	n/a	1.26	924	8.89	22.15	11.10	23.1	<0.02	3	0.6	0.32	6.66	0.18	24	<5.0	79000	28000	42000	4280	<5.0	<5.0	<5.0		<8.0	16	7.3	29	<2.0	<1.0	<2.0	216
DP@SA	7/14/04 10:15	0	7.14	987	8.10	23.02	214	27	<0.02	0.49	2.4	1.1	1.77	0.02	184	<5	30000	13000	17200	21.6	<5	<5	<5	<10	<8.0	5.1	13	120	<2.0	<3.0	<2.0	252
DP@SA	8/13/04 12:00	0	11.45	834	9.12	23.65	52.3		<0.02	0.08	1	0.08	1.75	<0.01	7	<5	14500	9800	17800	<5	<5	<5	<5	<10	<8.0	4.9	6.8	23	<2.0	<1.0	<2.0	184
DP@SA	9/2/04 12:00	0	5.24	725	7.80	22.55	19.7		<0.02		0.1	<0.05	2.17	0.02	36	<5	121000	88000	47000	<5	<5	<5	<5	<10	<8.0	4.2	13	70	<2.0	<1.0	<2.0	212
DP@SA	9/16/04 9:30	0	6.52	287	7.19	22.99	223		<0.02	0.41	1.2	<0.05	1.84	0.16	500	<5	94000	66000	28000	<5	<5	<5	<5	<10	<8.0	4.2	2.2	10	<2.0	<1.0	<2.0	190
DP@SA	9/28/04 10:30	0	7.11	794	8.54	22.14	12.2		<0.02	0.15	1.2	<0.05	1.36	0.04	12	<5	137000	126000	12300	<5	<5	<5	<5	<10	<8.0	<4	4.2	10	<2.0	<1.0	<2.0	210
DPK01P02	7/7/03 10:23	0.025	10.90	4005	7.38	21.60	10.0	23.1	<0.02	0.13	4.3	0.05	6.97	0.04	20	<5.0	22050	6650	31550	<5.0	<5.0	<5.0	<5.0		<8.0	15	16	58	<2.0	<1.0	<2.0	900
DPK01P02	8/10/03 11:00	DRY																														
DPK01P02	9/4/03 13:33	DRY																														
DPK01P02	8/19/04 0:00																															
DPK01P04	5/26/04 11:20	0.098	9	4251	7.93	17.41	6.91	28	<0.02	0.08	3.3	<0.05	0.95	0.1	6	<5	>200000	>200000	35000	15.4	<5	<5	<5	<10								1008
DPK01P04	8/19/04 10:20	0.160	9.01	3702	7.85	19.95	6.57	27	<0.02	0.1	3.2	0.1	1.65	0.07	6	<5	86000	16000	89000	148	<5	<5	<5	<10	<8.0	98	7.4	58	<2.0	3.0	<2.0	938
DPL01S04	6/6/03 12:24	0.003	12.59	1113	8.76	19.72	7.38	23.9	<0.02	0.03	1.0	0.12	0.77	0.04	24	<5.0	15600	955	390	<5.0	<5.0	<5.0	<5.0		<8.0	6.1	7.6	29	<2.0	<1.0	<2.0	352
DPL01S04	7/9/03 10:30	0.003	10.88	1508	8.19	20.18	10.6	23.0	<0.02	0.11	1.3	0.1	2.28	0.04	20	<5.0	24700	10350	40800	<5.0	<5.0	<5.0	<5.0		<8.0	14	7.4	33	<2.0	<1.0	<2.0	204
DPL01S04	8/25/03 8:00	DRY																														
DPL01S04	7/1/04 14:00	0.006	8.76	1028	8.02	22.08	11.3	27	<0.02	0.05	1	0.18	23.1	0.01	9	<5	89000	61000	11400	27.5	<5	<5	<5	<10	<8.0	5.1	10	40	<2.0	<1.0	<2.0	270
DPL01S04	7/23/04 12:30	0.015	9.41	1758	8.24	24.55	32	27	<0.02	0.17	5.9	0.4	6.76	<0.01	30	<5	10800	7500	9950	<5	<5	<5	<5	<10	<8.0	8.6	10	38	<2.0	<1.0	<2.0	476
DPL01S04	9/1/04 13:20	0.024	9.99	1240	8.04	22.75	16.9	28	<0.02	0.05	2.3	0.1	1.84	0.02	17	<5	146000	107000	48000	36.8	<5	<5	<5	<10	<8.0	6	9.6	33	<2.0	<1.0	<2.0	364
DPM00P01	5/30/03 9:45	0.063	9.46	8978	7.71	18.18	56.5	20.3	<0.02	0.29	3.0	0.17	2.74	0.3	110	<5.0	14000	12400	11400	<5.0	<5.0	<5.0	<5.0		<8.0	130	12	79	<2.0	14	<2.0	1028
DPM00P01	7/10/03 9:30	0.069	9.53	9578	7.76	19.77	10.2	20.5	<0.02	0.07	3.1	0.05	0.51	0.05	8	<5.0	12200	2350	6100	<5.0	<5.0	<5.0	395		<8.0	160	14	84	<2.0	16	<2.0	1014
DPM00P01	8/27/03 9:01	0.296	10.96	9660	7.73	20.31	3.57	24.0	<0.02	<0.01	1.9	0.3	0.4	0.08	13	<5.0	3500	2800	3900	<5.0	<5.0	<5.0	<5.0		<8.0	120	13	57	<2.0	14	<2.0	2486
DPM00P01	7/9/04 11:00	0.050	10.34	8339	8.03	20.27	6.68	27	<0.02	0.07	3	0.22	0.61	0.03	10	<5	7300	5200	7200	<5	<5	<5	<5	<10	<8.0	160	9.4	86	<2.0	15	<2.0	2606
DPM00P01	8/12/04 10:45	0.010	8.71	9463	7.85	20.62	5.01	24	<0.02	0.06	2.5	0.08	1.04	0.08	9	<5	48000	26000	26000	<5	<5	<5	<5	<10	<8.0	130	5.5	62	<2.0	3.0	<2.0	1684
DPM00P01	9/2/04 10:00	0	10.26	7190	8.01	21.73	9.42		<0.02	0.05	1.9	<0.05	0.99	0.09	53	<5	42000	35000	9700	44.6	<5	<5	<5	<10	<8.0	110	12	51	<2.0	9.0	<2.0	2236
LBI00P02	6/6/03 9:17	0.011	14.83	5406	8.48	17.62	5.20	18.0	<0.02	0.14	1.9	0.055	0.93	0.02	<5.0	<5.0	20700	2180	6100	<5.0	<5.0	<5.0	<5.0		<8.0	12	15	26	<2.0	<1.0	<2.0	694
LBI00P02	7/9/03 11:45	DRY																														
LBI00P02	8/25/03 8:30	DRY																														
LBI00P02	6/8/04 9:30	DRY																														
LBI00P02	8/5/04 11:00	0																														

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals							Hardness as $CaCO_3$
																									Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
LBJ00P02	6/6/03 11:02	0.012	10.64	2904	8.65	17.40	0.54	22.0	<0.02	0.01	1.4	<0.05	0.5	0.05	<5.0	<5.0	320	10	220	<5.0	<5.0	<5.0	<5.0		<8.0	13	4.9	29	<2.0	<1.0	<2.0	390
LBJ00P02	7/9/03 12:45	0.011	10.30	3126	8.05	18.75	2.10	27.5	<0.02	<0.01	1.5	<0.05	0.8	0.09	11	<5.0	630	630	2410	<5.0	<5.0	<5.0	<5.0									
LBJ00P02	8/25/03 9:24	0.008	9.43	3254	7.34	18.87	18.2	32.0	<0.02	<0.01	1.4	<0.05	0.72	0.3	<5.0	<5.0	690	130	560	<5.0	<5.0	<5.0	<5.0		<8.0	13	6	27	<2.0	<1.0	<2.0	1216
LBJ00P02	6/8/04 11:15	0.010	9.89	2854	8.25	17.90	0.34	28	<0.02	0.03	1.4	0.05	0.25	0.02	<5.0	<5	30	10	20	<5	<5	<5	<5	<10	<8.0	13	4.7	30	<2.0	<3.0	<2.0	1006
LBJ00P02	8/5/04 9:00	0.012	9.33	2607	8.16	18.82	0.91	24	<0.02	0.04	2.3	<0.05	0.47	<0.01	<5	<5	360	170	90	<5	<5	<5	<5	<10	<8.0	11	3.9	26	<2.0	<1.0	<2.0	996
LBJ00P02	9/16/04 8:30	0.008	7.17	3100	7.76	19.98	10.3		<0.02	0.19	0.7	0.1	0.7	1.19	140	<5	1620	310	350	<5	<5	<5	<5	<10	<8.0	11	<2	11	<2.0	<1.0	<2.0	1038
LBMBSD13	8/6/03 9:30	0.002	12.52	1373	7.64	24.91	24.6	25.0	<0.02	0.07	0.8	0.15	0.98	0.05	64	<5.0	11000	2650	1600	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	4.8	35	<2.0	<1.0	<2.0	196
LBMBSD13	8/18/03 9:30	0.003	9.45	3142	7.90	21.95	3.87	27.0	<0.02	0.09	<0.1	0.35	2.07	0.02	<5.0	<5.0	44000	21000	41000	<5.0	<5.0	<5.0	<5.0		<8.0	4.3	6	67	<2.0	<1.0	<2.0	119
LBMBSD13	8/28/03 11:30	0.001	8.46	3382	7.74	23.13	0.69	28.0	<0.02	0.07	0.1	<0.05	0.73	0.02	<5.0	<5.0	8800	2800	580	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	7.5	11	<2.0	<1.0	<2.0	636
LBMBSD13	9/5/03 12:00	0.001	6.28	2640	8.23	25.22	4.51	30.0	<0.02	0.13	0.7	0.6	1.45	0.01	5	<5.0	87000	32000	48000	39	<5.0	<5.0	<5.0		<8.0	<4.0	9.2	30	<2.0	<1.0	<2.0	702
LBMBSD13	9/16/03 13:05	0.019	7.89	3357	8.80	20.51	3.39	23.5	<0.02	<0.01	1.1	0.11	0.13	0.14	7	<5.0	13200	6700	10800	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2.6	16	<2.0	<1.0	<2.0	636
LBMBSD13	6/8/04 10:00	DRY																														
LBMBSD13	8/5/04 0:00	DRY																														
LBMBSD13	9/28/04 8:11	DRY																														
LFJ01P02	7/16/03 10:00	DRY																														
LFJ01P02	8/13/03 11:15	DRY																														
LFJ01P02	8/29/03 8:30	DRY																														
LFJ01P02	9/10/03 11:00	DRY																														
LFJ01P02	9/16/03 8:00	DRY																														
LFJ01P02	6/16/04 12:00	DRY																														
LFJ01P02	7/26/04 0:00	DRY																														
LFJ01P02	9/23/04 13:30	DRY																														
LFJ01P05	7/16/03 9:30	0.063	7.83	996	8.25	23.61	12.2	27.0	<0.02	0.08	0.5	1.3	4.47	<0.01	<5.0	<5.0				<5.0	<5.0	<5.0	<5.0		<8.0	9.2	23	65	<2.0	<1.0	2	312
LFJ01P05	8/13/03 10:45	0.039	9.13	1273	7.31	22.87	14.6	33.0	<0.02	0.03	0.4	1.6	3.98	0.02	10	<5.0	3600	1800	5400	160	<5.0	<5.0	<5.0		<8.0	7.2	7.9	57	<2.0	<1.0	<2.0	218
LFJ01P05	8/29/03 11:00	0.029	8.39	887	7.61	23.20	5.47	27.0	<0.02	0.08	1.1	0.25	3.24	0.03	7	<5.0	34000	21000	110	325	<5.0	<5.0	<5.0		<8.0	5.1	8	39	<2.0	<1.0	<2.0	278
LFJ01P05	9/10/03 11:34	0.001	8.83	1248	8.11	21.71	10.4	23.0	<0.02	<0.01	0.9	0.35	1.41	0.73	<5.0	<5.0	46000	5000	470	<5.0	<5.0	<5.0	<5.0		<8.0	9.6	12	64	<2.0	<1.0	<2.0	344
LFJ01P05	9/17/03 9:41	0.013	3.07	855	8.23	21.66	4.24	21.2	<0.02	0.02	3.1	0.18	1.83	0.11	<5.0	<5.0	7800	810	880	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	4.5	34	<2.0	<1.0	<2.0	230
LFJ01P05	6/16/04 13:00	DRY																														
LFJ01P05	7/26/04 12:50	0.010	8	1181	8.30	28.10	14.8	34	<0.02	0.12	2.9	0.5	2.62	0.02	34	<5	7900	6200	2500	<5	<5	<5	<5	<10	<8.0	8.7	13	72	<2.0	<3.0	2.1	280
LFJ01P05	8/24/04 11:45	DRY																														
LFJ01P05	9/16/04 1:15	0.004	8.27	1030	8.15	26.70	8.2	27	<0.02	0.06	1.7	0.2	2.33	0.08	35	<5	59000	44000	5900	<5	<5	<5	<5	<10	<8.0	6.3	8.8	44	<2.0	<3.0	<2.0	230
LFJ01P05	9/23/04 12:50	DRY																														
LFJ01P08	6/27/03 10:00	0.080	7.70	1330	8.10	19.40	5.68	32.0	<0.02	0.66	2.6	0.15	5.42	0.04	5	<5.0	39000	16000	36750	<5.0	<5.0	<5.0	11800		<8.0	8.6	15	78	<2.0	3.3	<2.0	376
LFJ01P08	8/13/03 9:15	0.024	6.30	1526	6.65	22.80	3.10	35.0	<0.02	0.14	2.0	0.1	1.29	0.03	<5.0	<5.0	38000	16000	55000	<5.0	<5.0	<5.0	<5.0		<8.0	6.2	8.9	29	<2.0	2.9	<2.0	528
LFJ01P08	8/29/03 9:00	0.018	8.89	1028	7.43	21.79	3.81	27.0	<0.02	0.05	1.9	<0.05	1.83	0.02	<5.0	<5.0	88000	14000	1540	402	<5.0	<5.0	133		<8.0	6.2	6.7	30	<2.0	3.3	<2.0	686
LFJ01P08	6/16/04 11:00	0.027	8.88	1182	8.00	19.55	3.18	21	<0.02	0.21	2	0.43	1.49	0.12	5	<5				<5	<5	15.9	<5	<10	<8.0	4	6.8	44	<2.0	3.0	<2.0	534
LFJ01P08	8/24/04 9:45	0.045	8.99	1283	8.00	20.86	5.73	27	<0.02	0.14	1.4	1.7	1.19	<0.01	10	<5	65000	56000	43000	32.7	<5	89.1	<5	<10	<8.0	5.4	8.2	29	<2.0	1.3	<2.0	360
LFJ01P08	9/14/04 12:45	0.072	7.63	1428	7.91	22.29	13.6		<0.02	0.23	2.2	0.1	1.5	0.11	28	<5	101000	38000	79000	<5	<5	<5	<5	<10	<8.0	7.6	7	34	<2.0	1.8	<2.0	426
LHJ04P04	8/11/03 13:05	1.800	8.79	4185	7.76	23.08	2.51	37.0	<0.02	0.05	1.7	0.1	0.91	0.03	<5.0	<5.0	8500	1800	6900	1430	<5.0	<5.0	<5.0		<8.0	5.4	4.8	32	<2.0	<1.0	<2.0	958
LHJ04P04	8/22/03 11:45	0.225	6.33	3698	7.56	23.90	12.3	32.0	<0.02	2.34	2.2	0.08	2.69	<0.01	<5.0	<5.0	129000	21000	6400	7580	<5.0	<5.0	<5.0		<8.0	<4.0	6.7	16	<2.0	<1.0	<2.0	940
LHJ04P04	9/5/03 8:30	0.405	7.82	2740	7.21	23.28	4.07	32.0	<0.02	0.31	2.2	<0.05	1.73	0.06	16	<5.0	43000	21000	32000	408	<5.0	<5.0	<5.0		<8.0	<4.0	5.6	23	<2.0	<1.0	<2.0	1128
LHJ04P04	7/13/04 9:00	0.780	8.14	2973	7.77	22.26	2.58	27	<0.02	0.02	1.8	0.09	0.82	0.05	6	<5	41000	12400	12200	10.6	<5	15.3	<5	<10	<8.0	9.4	6.2	45	<2.0	<1.0	<2.0	1018
LHJ04P04	7/27/04 9:45	0.288	7.54	3046	7.80	23.11	3.77	25	<0.02	0.09	2.8	0.1	1.21	0.04	10	<5	59000	27000	9250	770	<5	24.4	<5	<10	<8.0	7.7	5.2	51	<2.0	<1.0	4.9	1046
LHJ04P04	9/9/04 13:13	0.570	8.45	3580	7.35	22.90	15.3		<0.02	0.29	2.5	0.09	1.19	0.22	50	<5	59000	45000	26000	20	<5	<5	<5	<10	<8.0	11	6	17	<2.0	<1.0	<2.0	1220

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals: Chromium	Dissolved Metals: Nickel	Dissolved Metals: Copper	Dissolved Metals: Zinc	Dissolved Metals: Silver	Dissolved Metals: Cadmium	Dissolved Metals: Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
LNJ03P01	6/19/03 11:08	0.343	9.35	3206	7.82	19.51	5.41	20.0	<0.02	0.12	2.8	0.075	0.96	0.08	11	<5.0	149000	77000	416000	<5.0	<5.0	<5.0	<5.0		<8.0	26	4.6	52	<2.0	3	<2.0	804
LNJ03P01	7/10/03 9:00	1.890	8.15	2955	7.62	20.85	3.96	22.5	<0.02	2.32	2.5	0.15	2	0.04	<5.0	<5.0	12250	3950	8300	<5.0	<5.0	<5.0	<5.0		<8.0	20	21	38	<2.0	2.4	<2.0	538
LNJ03P01	8/27/03 13:12	1.536	9.49	3610	7.56	23.74	2.70	27.0	<0.02	0.01	1.3	<0.05	0.3	0.06	5	<5.0	2900	2600	3700	82	<5.0	<5.0	44		<8.0	18	6.1	52	<2.0	3.2	<2.0	1214
LNJ03P01	7/8/04 10:45	0.050			7.79	20.52	4.38	24	<0.02	0.29	3.8	<0.05	1.59	0.03	8	<5	9900	6200	8450	15.4	<5	109	<5	<10	<8.0	28	12	58	<2.0	3.0	<2.0	1104
LNJ03P01	7/27/04 12:00	2.700	7.7	3093	7.61	23.39	4.09	31	<0.02	0.51	2	0.28	1.39	0.01	7	<5	133000	106000	13000	63	<5	146	<5	<10	<8.0	25	9.4	32	<2.0	2.4	<2.0	964
LNJ03P01	9/15/04 12:30	0.050	7.36	3475	7.35	22.24	6.9		<0.02	0.13	3.4	<0.05	1.26	0.03	14	<5	39000	26000	7900	189	<5	192	<5	<10	<8.0	39	520	190	<2.0	3.0	<2.0	1116
LNJ03TBNGL	8/7/03 9:15	n/a	7.95	1719	7.32	21.16	7.74	30.0	<0.02	0.94	3.1	0.05	1.84	0.08	10	<5.0	41000	36000	4700	<5.0	<5.0	<5.0	<5.0		<8.0	10	11	52	<2.0	1.1	<2.0	442
LNJ03TBNGL	8/19/03 9:09	n/a	7.24	2277	7.57	22.40	5.43		<0.02	0.56	2.9	0.25	1.89	0.02	6	<5.0	2900	1620	1780	<5.0	<5.0	<5.0	<5.0		<8.0	17	6.9	33	<2.0	1.3	<2.0	458
LNJ03TBNGL	9/5/03 9:55	n/a	6.79	1930	7.53	22.68	12.6	33.0	<0.02	1.02	3.5	0.05	1.57	0.08	13	<5.0	47000	29000	32000	278	<5.0	<5.0	<5.0		<8.0	23	12	50	<2.0	2.0	<2.0	996
LNJ03TBNGL	9/12/03 11:00	n/a	7.64	1461	7.87	22.37	14.0	28.0	<0.02	1.16	3.6	0.15	1.34	0.12	14	<5.0	41000	6200	4400	104	<5.0	<5.0	<5.0		<8.0	18	17	70	<2.0	1.5	<2.0	574
LNJ03TBNGL	9/18/03 11:30	n/a	7.61	2266	7.83	21.44	5.49	33.0	<0.02	0.08	2.0	0.1	1.45	0.04	5	<5.0	46000	14900	40000	90	<5.0	<5.0	<5.0		<8.0	44	7.7	42	<2.0	4.5	<2.0	636
LNJ03TBNGL	7/8/04 12:00	0			7.65	21.84	4.98	25	<0.02	0.5	4.6	0.16	1.09	0.04																		1270
LNJ03TBNGL	7/13/04 10:15	0	6.73	2113	7.70	21.60	6.29	26	<0.02	1.39	3.5	0.01	1.87	0.03	9	<5	68000	50000	27000	1100	<5	<5	<5	<10	<8.0	20	8.3	49	<2.0	1.4	<2.0	652
LNJ03TBNGL	7/27/04 10:45	0	5.7	2312	7.75	22.72	4.76	26	<0.02	1.67	3.4	<0.05	2.55	0.04	14	<5	60000	45000	35000	58.1	<5	146	<5	<10								666
LNJ03TBNGL	9/15/04 1:30	0	6.14	2159	7.43	22.76	6.2		<0.02	0.8	2.2	<0.05	2.04	0.15	30	<5	119000	76000	48000	25.3	<5	<5	<5	<10	<8.0	14	12	68	<2.0	<3.0	<2.0	618
LNJ03TBNGL	9/23/04 13:00	0	9	1979	7.60	21.70	6.3	32	<0.02	0.44	3.4	<0.05	2.47	0.02	5	<5	88000	46000	41000	<5	<5	82.4	<5	<10	<8.0	13	5.4	23	<2.0	<1.0	<2.0	680
LNJ03TBNGL	9/30/04 13:00	0	8.9	1692	7.90	20.40	11.1	21	<0.02	0.58	2.7	0.1	2.05	0.05	12	<5	70000	61000	43000						<8.0	13	5.1	40	<2.0	<1.0	<2.0	622
LNJ04@J03	7/24/03 9:45	n/a	9.30	3962	7.37	22.13	4.91	23.5	<0.02	0.95	3.6	0.1	1.67	0.03	<5.0	9	12000	3000	5650	<5.0	<5.0	<5.0	<5.0		<8.0	71	5.6	69	<2.0	7	<2.0	614
LNJ04@J03	8/19/03 9:00	n/a	10.05	3650	7.12	25.90	9.04		<0.02	0.04	1.7	<0.05	0.27	0.06	8	<5.0	40000	23000	53000	81	<5.0	<5.0	<5.0		<8.0	100	25	80	<2.0	8.6	<2.0	1170
LNJ04@J03	9/4/03 13:05	n/a	11.93	3865	7.17	25.01	4.86	31.9	<0.02	0.1	4.3	0.05	0.24	0.03	<5.0	<5.0	8800	6100	7200	129	<5.0	<5.0	160		<8.0	100	4.6	67	<2.0	9.6	<2.0	1318
LNJ04@J03	9/12/03 8:45	n/a	7.04	2481	7.50	21.50	5.85		<0.02	0.37	4.1	0.07	0.77	0.02	6	<5.0	46000	37000	4200	190	<5.0	<5.0	<5.0		<8.0	86	4.4	51	<2.0	5.8	<2.0	936
LNJ04@J03	9/18/03 10:30	n/a	7.00	2971	7.58	23.16	11.9	23.0	<0.02	2.34	4.8	<0.05	0.3	0.04	<5.0	<5.0	50000	8200	11400	<5.0	<5.0	<5.0	<5.0		<8.0	60	3.7	49	<2.0	5.3	<2.0	842
LNJ04@J03	7/8/04 0:00	0													8	<5	16600	10800	7300	21.3	<5	<5	<5	<10	<8.0	80	6.7	72	<2.0	3	<2.0	
LNJ04@J03	7/27/04 13:15	0	20.72	4063	7.74	24.63	5.1	29	<0.02	0.61	3.2	<0.05	1.36	0.04	7	<5	89000	61000	9950	31.7	<5	3500	<5	<10	<8.0	81	7.4	72	<2.0	8.8	<2.0	1132
LNJ04@J03	9/9/04 12:02	0	8.63	2979	7.48	24.21	6.72		<0.02	0.01	7.1	0.1	1.97	0.13	10	<5	52000	27000	9450	11.2	10.3	<5	<5	<10	<8.0	69	2.9	35	<2.0	7.9	<2.0	1065
LNJ04@J03	9/23/04 12:15	0	21.6	3680	7.50	21.20	6.7	30	<0.02	0.66	4.1	<0.05	1.7	0.06	8	<5	1040000	71000	20000	<5	28.1	38.7	<5	<10	<8.0	89	2.8	37	<2.0	9.7	<2.0	1260
LNJ04@J03	9/30/04 12:20	0	13.2	2848	7.70	21.10	8.5	19	<0.02	0.28	3.9	0.1	1.83	0.13	8	<5	66000	48000	20800						<8.0	84	3	54	<2.0	7.6	<2.0	1120
LNK01P04	6/26/03 11:02	0.225	9.62	4914	8.07	18.71	4.28	27.0	<0.02	0.09	3.0	0.1	1.05	0.02	<5.0	<5.0	13950	6050	82650	148	<5.0	<5.0	<5.0		<8.0	170	4.7	64	<2.0	17	<2.0	550
LNK01P04	7/18/03 10:44	0.126	9.09	4033	7.90	20.03	6.17	21.2	<0.02	0.08	3.6	0.1	1.35	0.04	7	<5.0	7200	4300	6900	66	<5.0	<5.0	<5.0		<8.0	130	17	54	<2.0	11	<2.0	600
LNK01P04	8/28/03 10:30	0.105	9.11	4440	7.29	20.98	6.49	29.0	<0.02	<0.01	2.7	0.2	1.21	0.04	<5.0	<5.0	48000	9150	11400	66	<5.0	<5.0	<5.0		<8.0	99	18	56	<2.0	11	<2.0	1126
LNK01P04	9/15/04 11:30	0.224	8.22	4365	7.78	21.04	5.3		<0.02	0.03	3	0.15	1.89	0.02	6	<5	16200	7900	14800	160	<5	61.3	<5	<10	<8.0	110	6.9	69	<2.0	<3.0	<2.0	994
LNK01P07	6/20/03 8:45	0.135	8.85	1650	8.39	18.42	8.83	17.5	<0.02	0.23	2.4	<0.05	1.67	0.08	8	<5.0	24000	16000	8200	<5.0	<5.0	<5.0	<5.0		<8.0	5.4	9.1	33	<2.0	<1.0	<2.0	370
LNK01P07	8/8/03 10:16	0.480	8.99	1546	6.89	21.95	2.48	28.0	<0.02	0.09	4.0	0.1	2.37	0.07	<5.0	<5.0	18600	5000	3900	<5.0	<5.0	<5.0	<5.0		<8.0	7.7	12	36	<2.0	<1.0	<2.0	428
LNK01P07	8/27/03 8:45	0.504	8.33	1686	7.23	21.77	6.17	26.0	<0.02	0.16	3.0	0.05	2.03	0.01	14	<5.0	25000	16300	54000	336	<5.0	<5.0	83		<8.0	6	13	29	<2.0	<1.0	<2.0	370
LNK01P07	6/9/04 9:45	0.288	8.52	1850	7.80	19.20	5.07	17	<0.02	0.18	3	0.13	1.77	0.04	10	<5	54000	30000	16100	42.8	<5	397	<5	<10	<8.0	5.5	13	35	<2.0	<3.0	<2.0	530
LNK01P07	7/21/04 10:55	0.330	8.29	880	8.20	23.44	2.2	31	<0.02	0.4	2.9	0.08	1.79	0.24	<5	<5	12600	6900	11800	140	<5	<5	<5	<10	<8.0	6.8	12	70	<2.0	<1.0	<2.0	516
LNK01P07	8/31/04 10:45	0.300	7	1713	7.80	21.50	15.5	26	<0.02	1.56	3.4	<0.05	2.78	0.09	20	<5	67000	52000	7700	245	<5	135	<5	<10	<8.0	8.8	18	39	<2.0	<1.0	<2.0	660
LNK01P08	6/20/03 11:00	0.180	9.20	3003	8.25	18.30	6.47	21.1	<0.02	0.1	2.3	<0.05	1.45	0.03	5.6	<5.0	69000	5000	4500	<5.0	<5.0	<5.0	40.6		<8.0	6	10	31	<2.0	<1.0	<2.0	724
LNK01P08	8/8/03 11:24	0.036	8.91	2451	6.97	21.31	2.02	32.0	<0.02	0.48	5.5	0.05	3.87	0.03	<5.0	<5.0	129000	940	102000	110	<5.0	<5.0	<5.0		<8.0	4.1	12	40	<2.0	<1.0	<2.0	734
LNK01P08	8/27/03 9:53	0.210	8.71	2341	7.40	21.20	2.71	24.0	<0.02	0.07	2.9	0.05	1.15	0.08	<5.0	<5.0	35000	4300	46000	190	<5.0	<5.0	<5.0		<8.0	<4.0	10	23	<2.0	<1.0	<2.0	766
LNK01P08	6/9/04 11:00	0.072	8.5	2620	7.90	18.90	3.44	25	<0.02	0.33	2.4	0.9	1.86	0.06	<5.0	<5	88000	42000	17700	185	<5	<5	<5	<10	<8.0	6.6	10	39	<2.0	<3.0	<2.0	910
LNK01P08	7/21/04 12:00	0.080	7.98	2622	8.13	23.54	2.36	31	<0.02	0.15	2.9	0.13	1.51	0.02	<5	<5	31000	21000	10600	289	<5	<5	<5	<10	<8.0	9.1	15	63	<2.0	<1.0	<2.0	902
LNK01P08	8/31/04 12:00	0.756	8	3761	7.90	18.90	4.44	29	<0.02	0.64	2.6	<0.05	2.02	0.03	7	<5	10000	7300	6500	210	<5	<5	<5	<10	<8.0	11	7.8	27	<2.0	<1.0	<2.0	1580

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals: Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^{0}C	NTU	^{0}C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
LNK01P09	6/20/03 11:00	0.380	10.26	4123	8.16	17.16	22.70	21.1	<0.02	0.05	2.9	<0.05	1.37	0.05	36	<5.0	740	<10	1400	210	<5.0	<5.0	144		<8.0	6.3	6.3	47	<2.0	<1.0	<2.0	822
LNK01P09	8/8/03 11:21	0.405	10.28	3280	6.45	19.10	7.10	32.0	<0.02	0.11	3.1	0.08	1.99	0.04	10	<5.0	<10	<10	1550	<5.0	<5.0	<5.0	<5.0		<8.0	4.1	7	34	<2.0	<1.0	<2.0	552
LNK01P09	8/27/03 9:50	0.420	9.93	3748	7.31	18.63	17.80	24.0	<0.02	0.05	4.2	<0.05	2.02	0.03	34	<5.0	39000	29000	37000	238	<5.0	<5.0	276		<8.0	<4.0	10	33	<2.0	<1.0	<2.0	624
LNK01P09	6/9/04 11:05	0.056	11	3890	8.00	17.10	3.99	25	<0.02	0.04	2.8	0.15	1.71	0.04	<5.0	<5	510	350	610	21.8	<5	<5	<5	<10	<8.0	7.5	5.4	41	<2.0	<3.0	<2.0	1290
LNK01P09	7/21/04 12:00	0.054	8.77	3768	8.08	22.14	3.88	31	<0.02	0.04	1.4	<0.05	1.56	0.04	16	<5	610	510	460	12.3	<5	<5	<5	<10	<8.0	9.1	6.1	63	<2.0	<1.0	<2.0	1204
LNK01P09	8/31/04 12:00	0.060	3.4	2091	7.00	21.50	3.33	29	<0.02	0.33	3.4	0.1	2.14	0.03	5	<5	70000	57000	35000	136	<5	32.6	<5	<10								960
LNK01S01	6/26/03 9:30	0.900	9.17	3892	7.87	19.32	8.36	26.0	<0.02	0.09	2.5	0.075	1.45	0.03	7	<5.0	8850	2100	3270	199	<5.0	<5.0	204		<8.0	28	7.8	41	<2.0	1.2	<2.0	618
LNK01S01	8/19/03 11:09	0.442	8.36	4258	7.81	21.58	7.17	28.0	<0.02	0.08	4.0	0.1	1.47	<0.01	12	<5.0	39000	27000	38000	<5.0	<5.0	<5.0	346		<8.0	25	21	59	<2.0	1.4	<2.0	698
LNK01S01	9/5/03 10:45	0.273	7.33	4090	7.37	21.75	5.89	33.0	<0.02	1.02	3.5	0.05	1.57	0.08	13	<5.0	39000	17900	33000	1060	<5.0	<5.0	1590		<8.0	27	12	40	<2.0	1.5	<2.0	1262
LNK01S01	9/12/03 12:30	0.384	7.88	3258	7.79	21.30	0.49		<0.02	0.15	3.6	0.2	1.77	0.01	13	<5.0	70000	56000	620	549	<5.0	<5.0	2710		<8.0	26	11	40	<2.0	1.4	<2.0	742
LNK01S01	9/18/03 9:30	0.371	8.56	3677	7.91	21.00	4.35	28.0	<0.02	0.18	3.7	0.1	1.68	<0.01	22	<5.0	93000	23000	59000	138	<5.0	<5.0	139		<8.0	21	8.7	35	<2.0	<1.0	<2.0	1118
LNK01S01	5/26/04 10:30	0.228	9.08	3742	7.85	18.67	11.6	28	<0.02	0.19	2.9	0.01	1.64	0.08	17	7	8900	7100	21100	258	<5	83.9	<5	<10	<8.0	22	12	58	<2.0	<3.0	<2.0	1033
LNK01S01	8/19/04 11:15	0.520	9.52	3908	7.76	21.20	6.73	28	<0.02	0.16	3.2	<0.05	1.93	0.01	13	<5	181000	40000	103000	15.8	<5	22.3	<5	<10	<8.0	43	13	53	<2.0	<3.0	<2.0	1110
LNK01S01	9/15/04 10:45	0.342	8.15	4580	7.77	22.03	5.4		<0.02	0.15	2.1	0.1	1.51	0.04	12	<5	78000	48000	40000	189	<5	227	<5	<10								1244
LNK01S01	9/23/04 11:00	0.135	14.1	3892	7.90	20.80	7.8	28	<0.02	0.45	3.5	0.1	1.15	0.03	17	<5	18600	11200	26000	60	<5	371	<5	<10	<8.0	21	7.9	22	<2.0	<1.0	<2.0	1300
LNK01S01	9/30/04 11:00	0.324	12.9	3634	8.00	20.70	16	19	<0.02	0.08	5.6	0.1	2.44	0.16	26	<5	39000	24000	13000						<8.0	23	8.9	37	<2.0	<1.0	<2.0	1250
LNK01S02	9/10/03 12:00	0.010	11.38	1345	8.96	25.13	8.87	26.0	<0.02	0.02	0.4	<0.05	0.76	0.06	9	<5.0	5000	2100	2800	<5.0	<5.0	<5.0	<5.0		<8.0	14	14	24	<2.0	<1.0	<2.0	416
LNK01S02	9/12/03 9:30	0.047	7.27	1372	7.96	20.83	16.5		<0.02	0.25	0.9	0.1	2.55	0.02	12	<5.0	1620	1300	240	<5.0	<5.0	<5.0	<5.0		<8.0	9.3	14	26	<2.0	<1.0	<2.0	594
LNK01S02	9/18/03 8:30	0.098	6.97	2848	7.83	19.27	2.36	23.0	<0.02	0.09	3.6	<0.05	0.39	0.04	9	<5.0	2900	2400	4500	77	<5.0	<5.0	279		<8.0	4.6	5.3	19	<2.0	<1.0	<2.0	1046
LNK01S02	9/23/03 8:30	0.108	7.85	2710	7.90	19.21	3.63	25.0	<0.02	<0.01	3.8	<0.05	0.29	0.03	5	<5.0	1660	360	7800	<5.0	<5.0	<5.0	<5.0		<8.0	4.7	2.9	18	<2.0	<1.0	<2.0	1070
LNK01S02	9/24/03 8:30	0.078	9.05	2687	7.95	18.97	6.80	20.0	<0.02	0.13	3.4	<0.05	0.31	0.03	<5.0	<5.0	2400	620	830	<5.0	<5.0	<5.0	<5.0		<8.0	4.3	3.7	14	<2.0	<1.0	<2.0	812
LNK01S02	7/14/04 12:00	0	9.06		7.97	23.23	8.24	27	<0.02	0.07	3.9	0.1	1.09	0.05	13	<5	3600	1450	960	<5	<5	<5	<5	<10	<8.0	6.3	5.5	160	<2.0	<3.0	<2.0	918
LNK01S02	8/19/04 9:17	0.300	9.31	2621	7.65	18.90	4.49		<0.02	0.08	2.8	0.05	1.12	0.08	8	<5	2300	1250	4700	<5	<5	<5	<5	<10	<8.0	8.7	7	44	<2.0	<3.0	<2.0	918
LNK01S02	9/15/04 3:45	0.010	6.93	2805	7.64	20.21	8.6		<0.02	0.18	2.4	<0.05	0.74	0.07	15	<5	3100	2400	1080	<5	<5	<5	<5	<10	<8.0	7.8	<2	36	<2.0	<3.0	<2.0	950
LNK01S02	9/23/04 10:10	0.250	13.3	2531	7.70	16.60	3.1	27	<0.02	0.02	2	0.1	1.03	0.05	<5	<5	427000	1330	3900	<5	<5	<5	<5	<10	<8.0	6.6	2.4	<10	<2.0	<1.0	<2.0	1050
LNK01S02	9/30/04 10:00	0.100	11.4	2384	7.90	17.80	8.8	17	<0.02	0.08	2.2	<0.05	0.81	0.04	6	<5	1420	430	730						<8.0	8.5	3.7	18	<2.0	<1.0	<2.0	980
LNL03P06	8/5/03 11:58	0.018	8.77	2267	7.38	22.83	1.35	33.0	<0.02	<0.01	7.3	0.05	1.27	0.06	<5.0	<5.0	1900	1400	1100	<5.0	<5.0	<5.0	<5.0		<8.0	38	15	41	<2.0	2.6	<2.0	588
LNL03P06	8/14/03 12:15	0.020	8.95	2477	6.99	23.15	2.04	37.0	<0.02	0.04	6.9	0.1	1.53	0.06	<5.0	<5.0	9300	6300	2600	<5.0	<5.0	<5.0	<5.0		<8.0	42	19	51	<2.0	2.3	<2.0	504
LNL03P06	9/2/03 8:46	0.218	8.48	1180	8.14	23.32	4.36	24.7	<0.02	0.03	0.7	<0.05	0.45	0.09	41	<5.0	62000	28000	22000	334	<5.0	<5.0	<5.0		<8.0	19	6.4	17	<2.0	4.3	<2.0	566
LNL03P06	9/11/03 10:30	0.384	7.52	1128	7.52	23.76	1000	33.0	<0.02	0.322	1.4	0.1	0.27	0.25	320	<5.0	1210	440	450	<5.0	<5.0	<5.0	<5.0		<8.0	11	7.4	42	<2.0	<1.0	<2.0	415
LNL03P06	9/17/03 11:09	0.065	1.11	2727	8.03	21.48	8.89	36.0	<0.02	0.25	7.9	0.21	1.86	0.21	6	<5.0	38000	13200	42000	<5.0	<5.0	<5.0	<5.0		<8.0	42	36	43	<2.0	3.2	<2.0	994
LNL03P06	6/30/04 10:00	0.040	7.54	2683	7.95	20.01	24.3	25	<0.02	0.68	<0.1	0.18	2.71	0.09	23	<5	78000	45000	18800	<5	<5	<5	<5	<10	<8.0	33	18	91	<2.0	3.0	<2.0	864
LNL03P06	8/19/04 12:30	0.050	8.26	2459	7.79	21.78	7.23	29	<0.02	0.05	4.5	<0.05	1.73	0.05	8	<5	26000	8050	10300	<5	<5	<5	<5	<10	<8.0	41	29	86	<2.0	3.0	<2.0	866
LNL03P06	8/31/04 10:00	0.040	8.33	1957	7.40	22.10	3.43	24	<0.02	0.06	4.7	<0.05	1.43	0.07	<5	<5	36000	26000	6500	<5	<5	<5	<5	<10	<8.0	31	22	11	<2.0	<1.0	<2.0	850
LNL03P06	9/22/04 11:30	0.250	13.39	1475	8.05	22.31	81.7	31	<0.02	0.21	2.6	0.2	2.24	0.06	1580	<5	42000	27000	29000	38.3	<5	<5	<5	<10								540
LNL03P06	9/29/04 10:22	0.010	12.85	1746	8.19	20.89	15	26	<0.02	0.01	7.3	1.3	4.79	0.24	18	<5	>200000	>200000	>200000	11.2	<5	<5	<5	<10	<8.0	24	21	68	<2	1.2	<2	714
LWJ01@LAB	7/24/03 11:25	0.013	11.53	2008	8.03	22.71	3.87	26.5	<0.02	0.06	2.6	<0.05	0.68	0.04	<5.0	<5.0	3050	1150	970	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	12	38	<2.0	<1.0	<2.0	224
LWJ01@LAB	8/12/03 14:15	0.300	7.96	2527	7.91	22.26	0.43	34.0	<0.02	0.02	1.4	0.1	0.4	0.03	<5.0	<5.0	3450	1400	210	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2	22	<2.0	<1.0	<2.0	594
LWJ01@LAB	8/29/03 8:15	0.042	8.39	2579	7.17	22.60	0.34	27.0	<0.02	0.03	2.0	<0.05	0.43	0.04	<5.0	<5.0	180000	61000	50	33	<5.0	<5.0	<5.0		<8.0	<4.0	<2.0	15	<2.0	<1.0	<2.0	774
LWJ01@LAB	9/10/03 10:43	1.620	13.12	1994	8.21	21.39	5.28	23.0	<0.02	<0.01	0.9	0.17	0.04	0.14	<5.0	<5.0	4800	1570	310	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2.8	24	<2.0	<1.0	<2.0	736
LWJ01@LAB	9/16/03 11:30	0.480	7.89	2001	7.77	22.36	2.31	29.0	<0.02	0.04	1.4	<0.05	0.55	<0.01	<5.0	<5.0	5800	4900	6300	2430	<5.0	<5.0	<5.0		<8.0	<4.0	<2.0	20	<2.0	<1.0	<2.0	1138
LWJ01@LAB	6/17/04 9:45	0.040	11.05	2506	7.97	20.70	0.18	22	<0.02	<0.01	1.6	0.1	0.33	0.03	<5	<5	2100	1290	390	<5	<5	<5	<5	<10	<8.0	<4	3.6	33	<2.0	<3.0	<2.0	826
LWJ01@LAB	7/26/04 12:00	0.010	8.4	2394	7.70	23.60	0.54	35	<0.02	0.11	0.9	<0.05	0.39	0.03	<5	<5	10000	3600	5600	<5	<5	<5	<5	<10	<8.0	5	5.4	45	<2.0	<3.0	<2.0	804
LWJ01@LAB	8/24/04 11:15	0.100	9.08	2486	7.80	22.50	1.18	28	<0.02	0.02	1.3	<0.05	0.72	<0.01	<5	<5	44000	28000	19200	<5	<5	<5	<5	<10	<8.0	6	2.1	35	<2.0	<1.0	<2.0	874
LWJ01@LAB	9/16/04 12:30	0.050	7.6	2577	7.48	23.20	0.7	26	<0.02	0.01	0.4	<0.05	0.82	0.03	<5	<5	60000	39000	8000	<5	<5	<5	<5	<10	<8.0	7.5	2.7	22	<2.0	<3.0	<2.0	850
LWJ01@LAB	9/23/04 12:16	5.400	12.01	1981	8.10	22.36	3.09		<0.02	0.13	1	0.47	0.29	0.19	28	<5	1400	780	1040	<5	<5	145	<5	<10	<8.0	5	2.3	<10	<2.0	<1.0	<2.0	625

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
MVJ01P03	6/27/03 11:50	0.165	7.28	1770	7.93	21.80	5.44	33.0	<0.02	0.07	1.0	0.19	1.13	0.02	<5.0	<5.0	27000	12000	40400	805	<5.0	<5.0	<5.0		<8.0	5.5	19	70	<2.0	<1.0	2.1	336
MVJ01P03	8/13/03 11:45	0.076	9.50	2077	7.21	23.98	1.68	39.0	<0.02	0.07	0.9	0.14	1.77	0.07	<5.0	<5.0	25000	6000	15400	1300	<5.0	<5.0	<5.0		<8.0	<4.0	6.1	37	<2.0	<1.0	<2.0	528
MVJ01P03	9/2/03 13:15	0.022	1.35	1560	7.86	23.13	1.66	30.2	<0.02	0.01	1.1	0.33	0.48	0.11	6	<5.0	60000	43000	16100	<5.0	<5.0	<5.0	<5.0		<8.0	4	12	35	<2.0	<1.0	<2.0	796
MVJ01P03	9/11/03 13:00	0.066	6.57	1942	7.35	23.65	3.66	36.0	<0.02	0.222	1.5	0.1	1.45	0.01	32	<5.0	18600	5200	70	<5.0	<5.0	<5.0	<5.0		<8.0	4.6	16	40	<2.0	<1.0	<2.0	798
MVJ01P03	9/17/03 8:22	0.087	2.17	1769	7.62	21.79	4.65	20.9	<0.02	0.17	1.6	0.3	1.36	0.09	<5.0	<5.0	34000	7600	15800	80	<5.0	<5.0	<5.0		<8.0	<4.0	17	34	<2.0	<1.0	<2.0	486
MVJ01P03	6/17/04 10:45	0.036	11.1	2401	7.89	20.30	2.85	29	<0.02	0.12	1.5	0.1	1.37	0.04	<5.0	0.6	25000	15200	7000	<5	<5	<5	<5	<10	<8.0	4.5	6.6	45	<2.0	<3.0	<2.0	856
MVJ01P03	7/26/04 10:45	0.058	7.8	2281	7.70	23.00	2.3	28	<0.02	0.12	1.5	0.25	7.82	0.01	7	<5	85000	70000	23000	31.1	<5	<5	<5	<10	<8.0	6.6	9.7	47	<2.0	<3.0	<2.0	600
MVJ01P03	8/24/04 12:30	0.038	7.79	2351	7.57	21.75	3.72	29	<0.02	1.32	1.9	<0.05	1.82	<0.01	<5	<5	28000	13000	49000	36.3	<5	<5	<5	<10	<8.0	7.9	39	53	<2.0	<1.0	<2.0	656
MVJ01P03	9/16/04 14:25	0.090	6.8	3155	7.70	23.20	3.6	30	<0.02	0.23	1.8	0.2	2.04	0.09	<5	<5	106000	71000	18400	<5	<5	226	<5	<10	<8.0	13	38	40	<2.0	<3.0	<2.0	840
MVJ01P03	9/23/04 11:32	0.076	7.9	1041	7.52	23.98	4.13		<0.02	1.45	2.1	0.4	2.33	0.07	5	<5	47000	30000	34000	<5	<5	5	<5	<10	<8.0	7	16	30	<2.0	<1.0	<2.0	480
MVJ07P02	7/7/03 13:14	0.070	12.66	1810	7.90	21.07	195	34.1	<0.02	1.17	2.1	<0.05	1.87	0.15	<5.0	<5.0	2180	1260	750	<5.0	<5.0	<5.0	<5.0		<8.0	8	18	50	<2.0	<1.0	<2.0	490
MVJ07P02	8/18/03 13:09	0.378	6.12	2320	7.73	27.77	12.50		<0.02	0.01	1.7	<0.05	0.94	0.1	31	<5.0	52000	27000	48000	<5.0	<5.0	<5.0	<5.0		<8.0	12	6.7	57	<2.0	1.5	<2.0	710
MVJ07P02	9/4/03 9:05	0.103	8.35	1325	7.97	22.60	11.30	32.5	<0.02	0.03	0.7	0.32	0.74	0.12	13	<5.0	10500	8700	9500	87	<5.0	<5.0	<5.0		<8.0	4.9	8.9	50	<2.0	1.3	<2.0	472
MVJ07P02	6/17/04 13:00	0.081	11.84	1649	8.13	19.80	3.38	33	<0.02	<0.01	3.3	<0.05	2.05	0.01	8	<5	13600	2400	6200	24.8	<5	5	<5	<10	<8.0	6.9	13	52	<2.0	<3.0	<2.0	482
MVJ07P02	7/28/04 0:00	0.066	7.96	1494	8.31	21.99	5.66		<0.02	0.03	2.8	0.22	1.31	0.07	14	<5	123000	81000	18600	21.5	<5	7170	<5	<10	<8.0	<4	12	34	<2.0	<1.0	<2.0	410
MVJ07P02	8/26/04 11:45	0.108	9.21	1500	8.03	20.97	7.37	25	<0.02	0.09	3.1	0.25	3.81	<0.01	5	<5	159000	95000	197000	55.9	<5	<5	<5	<10	<8.0	13	79	380	<2.0	2.0	3.3	438
MVL02P20	6/11/03 12:00	0.015	10.73	767	8.57	17.77	9.64	26.4	<0.02	0.05	1.8	0.06	1.21	0.01	19	<5.0	400	155	190	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	9	20	<2.0	<1.0	<2.0	172
MVL02P20	8/14/03 9:30	0.035	9.79	1144	7.37	21.71	3.45	30.0	<0.02	0.02	1.3	0.07	1.4	0.03	<5.0	<5.0	8100	3400	6600	530	<5.0	<5.0	<5.0		<8.0	<4.0	7.8	27	<2.0	<1.0	<2.0	156
MVL02P20	9/4/03 10:55	0.017	8.92	1240	7.98	21.80	1.90	32.4	<0.02	0.27	1.0	0.2	0.65	0.06	<5.0	<5.0	75000	42000	53000	5140	<5.0	<5.0	<5.0		<8.0	4.3	15	27	<2.0	<1.0	<2.0	342
MVL02P20	7/14/04 0:00	NO	ACCES S																													
MVL02P20	7/28/04 9:30	0.096	9.12	832	8.24	21.40	6.94		<0.02	0.13	0.9	0.4	1.31	<0.01	10	<5	52000	28000	42000	656	<5	38	<5	<10	<8.0	8.7	16	77	<2.0	<1.0	<2.0	208
MVL02P20	8/4/04 13:30	0.008	8.66	817	8.41	20.41	2.37		<0.02		1.5	0.16	1.82	0.03	<5	<5	36000	28000	10600	475	<5	290	<5	<10	<8.0	4	9.1	35	<2.0	<1.0	<2.0	296
MVL02P20	8/26/04 9:00	0.350	9.13	885	8.14	20.60	4.95	27	<0.02	0.01	1.7	0.1	1.7	0.02	7	<5	88000	58000	9850	41.7	<5	31.1	<5	<10	<8.0	5.1	7.6	29	<2.0	<1.0	<2.0	252
MVL03P04	6/11/03 14:01	0.216	11.87	2050	8.06	22.67	0.87	21.5	<0.02	<0.01	1.3	0.05	0.66	0.06	<5.0	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0		<8.0	8.1	4.6	21	<2.0	<1.0	<2.0	492
MVL03P04	8/14/03 11:15	0.054	13.99	2256	7.46	24.68	1.77	36.0	<0.02	0.1	<0.1	<0.05	1.39	0.13	<5.0	<5.0	8600	3100	860	53.6	<5.0	<5.0	<5.0		<8.0	7.8	5.6	43	<2.0	<1.0	<2.0	536
MVL03P04	9/2/03 10:07	0.250	11.40	2545	8.11	23.27	1.24	31.2	<0.02	0.01	1.1	0.5	0.42	0.1	<5.0	<5.0	3800	3100	760	<5.0	<5.0	<5.0	<5.0		<8.0	6.3	6.4	23	<2.0	<1.0	<2.0	962
MVL03P04	6/30/04 12:30	0.092	9.24	2149	8.09	19.75	1.28	24	<0.02	0.02	1.9	0.03	0.85	0.05	<5.0	<5	4000	2100	1610	<5	<5	<5	<5	<10	<8.0	13	7.9	51	<2.0	<3.0	<2.0	740
MVL03P04	7/28/04 12:00	0.048	10.99	2631	8.39	25.83	1.77		<0.02	0.02	2.1	<0.05	1	<0.01	<5	<5	450	260	1200	<5	<5	<5	<5	<10	<8.0	13	5.9	24	<2.0	<1.0	<2.0	962
MVL03P04	8/26/04 10:00	0.083	7.97	2295	7.75	20.60	1.53	27	<0.02	0.02	1.1	<0.05	1.69	<0.01	<5	<5	300	110	1130	28.7	<5	<5	<5	<10	<8.0	15	5.2	31	<2.0	<1.0	<2.0	780
MVL03P11	6/11/03 9:26	0.056	11.16	1320	7.96	19.33	7.50	21.5	<0.02	0.08	2.4	0.15	2.5	0.06	20	<5.0	40	<10	<10	<5.0	<5.0	<5.0	<5.0		<8.0	8.4	7.3	18	<2.0	1.1	<2.0	610
MVL03P11	8/14/03 10:15	0.084	9.72	2491	7.21	23.03	1.14	34.0	<0.02	0.06	2.1	<0.05	1.23	0.05	<5.0	<5.0	28000	12200	2800	109	<5.0	<5.0	<5.0		<8.0	8.1	5.2	26	<2.0	1.6	<2.0	858
MVL03P11	9/2/03 12:02	0.090	3.05	2796	8.26	23.86	1.11	28.6	<0.02	0.01	0.5	0.28	0.28	0.05	8	<5.0	62000	48000	7800	<5.0	<5.0	<5.0	<5.0		<8.0	6	9.4	23	<2.0	1.5	<2.0	1040
MVL03P11	6/30/04 11:00	0.072	8.08	2316	8.20	20.46	2.18	24	<0.02	0.55	2	1.1	0.08	0.08	<5.0	<5	15300	8800	6700	<5	<5	<5	<5	<10	<8.0	10	7.7	41	<2.0	<3.0	<2.0	964
MVL03P11	7/28/04 10:15	0.126	8.33	2622	8.18	22.42	1.87	26	<0.02	0.01	2.7	0.15	0.85	0.06	<5	<5	29000	15600	6000	13.5	<5	21.7	<5	<10	<8.0	13	7.5	22	<2.0	1.1	<2.0	1086
MVL03P11	8/26/04 11:00	0.084	9.28	2322	8.17	21.85	3.28	23	<0.02	0.03	1.7	0.1	0.96	<0.01	5	<5	52000	32000	19600	<5	<5	305	<5	<10	<8.0	12	6.9	22	<2.0	1.1	<2.0	1026
RSML02P28	7/15/03 9:30	0.072	8.55	882	8.23	20.05	25.8	28.0	<0.02	0.9	1.1	0.3	0.85	0.05	25	<5.0	10000	5600	5150	<5.0	<5.0	<5.0	<5.0		<8.0	17	19	75	<2.0	<1.0	<2.0	172
RSML02P28	8/15/03 10:20	0.016	9.33	799	6.77	21.35	10.2	29.0	<0.02	0.14	1.8	0.22	0.17	0.04	13	<5.0	4200	1450	1850	<5.0	<5.0	<5.0	<5.0		<8.0	17	19	75	<2.0	<1.0	<2.0	158
RSML02P28	9/8/03 12:27	0.030	8.81	775	7.85	23.58	5.22	32.0	<0.02	0.14	1.0	0.45	0.23	0.1	<5.0	<5.0	37000	2800	7600	<5.0	<5.0	<5.0	<5.0		<8.0	4.1	16	61	<2.0	<1.0	<2.0	272
RSML02P28	6/15/04 11:30	0.040	14	522	8.30	20.00	5.59	23	<0.02	0.24	1.4	0.55	1.13	0.01	<5.0	<5	11200	7200	6800	<5	<5	<5	<5	<10	<8.0	6.1	15	63	<2.0	<1.0	<2.0	270
RSML02P28	8/16/04 11:17	0.010	9	800	7.96	23.44	42.8		<0.02	0.23	1.8	<0.05	0.97	<0.01	35	<5	6400	1460	3400	11	<5	<5	<5	<10	<8.0	7.4	6.4	63	<2.0	<3.0	<2.0	204
RSML02P28	9/13/04 0:00	DRY																												3		
RSML02P32	7/15/03 10:58	0.114	6.91	1090	7.98	21.65	5.89	28.2	<0.02	0.48	3.6	<0.05	1.15	<0.01	8	<5.0	29000	18000	24800	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	23	41	<2.0	<1.0	<2.0	298
RSML02P32	8/15/03 11:32	1.100	9.34	1174	7.01	22.92	11.6	37.0	<0.02	0.22	2.4	0.22	1.34	0.02	8	<5.0	4950	1800	3300	310	<5.0	<5.0	<5.0		<8.0	<4.0	22	34	<2.0	<1.0	<2.0	234
RSML02P32	9/8/03 13:27	0.063	7.93	1036	7.71	22.97	3.16	30.0	<0.02	0.146	1.2	0.15	0.39	0.17	<5.0	<5.0	8900	6200	8000	128	<5.0	<5.0	62		<8.0	<4.0	11	24	<2.0	<1.0	<2.0	344
RSML02P32	6/21/04 13:00	0.050	8.41	1606	8.10	20.21	4.9	28	<0.02	0.16	3.9	0.13	1.21	0.02	6	<5	16100	8950	10000	199	<5	<5	<5	<10	<8.0	4	6.7	70	<2.0	<1.0	<2.0	404
RSML02P32	8/16/04 12:29	0.108	9.21	1253	8.02	23.31	1.93		<0.02	0.03	3	<0.05	1.68	<0.01	<5	<5	31000	24000	50000	56.3	<5	19.8	<5	<10	<8.0	4.8	12	41	<2.0	<3.0	<2.0	392
RSML02P32	9/13/04 10:28	0.137	8.71	1037	7.77	23.00	2.88		<0.02	0.25	2.9	<0.05	1.34	0.13	<5	<5	45000	35000	9450	147	<5	289	<5	<10						3		438

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals: Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Hardness as $CaCO_3$
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
SCBS@M02	8/11/03 8:30	0.009	5.23	13700	7.89	19.98	18.8	29.0	<0.02	0.05	2.6	2.6	12.76	0.08	21	<5.0	78000	37000	58000	<5.0	<5.0	<5.0	<5.0		<8.0	41	62	220	<2.0	3.2	4.3	1220
SCBS@M02	8/22/03 9:00	0.010	5.32	1376	7.32	20.48	8.13	22.0	<0.02	0.4	3.2	0.12	1.26	0.03	5	<5.0	62000	14000	4300	<5.0	<5.0	<5.0	<5.0		<8.0	18	3.9	30	<2.0	1.9	<2.0	1064
SCBS@M02	9/9/03 9:08	0.004	5.23	1219	8.00	20.60	10.2	22.0	<0.02	0.368	1.8	0.3	0.27	0.11	12	<5.0	<10	<10	<10	<5.0	<5.0	<5.0	<5.0		<8.0	18	7.1	44	<2.0	<1.0	<2.0	4042
SCBS@M02	9/15/03 14:03	0.028	1.69	18300	8.04	26.40	5.00	28.5	<0.02	0.163	0.9	0.55	0.22	0.14	12	<5.0	14500	27000	78000	<5.0	<5.0	<5.0	<5.0		<8.0	21	9.1	27	<2.0	<1.0	<2.0	4886
SCBS@M02	9/18/03 12:11	0.009	1.75	19370	8.01	19.94	10.6	30.2	<0.02	3.3	0.8	1.35	0.86	0.54	8	<5.0	166000	46000	119000	<5.0	<5.0	<5.0	<5.0		<8.0	19	18	52	<2.0	2.2	<2.0	3506
SCBS@M02	7/15/04 0:00	DRY																														
SCBS@M02	7/21/04 9:45	0.010	7.66	12162	8.19	20.98	7.48	25	<0.02	0.26	4.4	0.38	2.02	0.06	16	<5	610	510	460	<5	<5	<5	<5	<10	<8.0	21	8.4	62	<2.0	<1.0	<2.0	3120
SCBS@M02	8/13/04 11:00	0.010	8.85	6945	8.18	20.12	7.82		<0.02	0.02	4.7	0.13	1.27	0.1	10	<5	64000	37000	11200	<5	<5	<5	<5	<10	<8.0	20	9	39	<2.0	<1.0	<2.0	1624
SCBS@M02	9/8/04 9:30	0.000	7.98	9164	8.13	20.90	6.5	26	<0.02	<0.01	3	0.45	1.69	0.04	10	<5	>200000	>200000	129000	<5	<5	<5	<5	<10	<8.0	26	13	97	<2.0	<1.0	<2.0	2834
SCBS@M02	9/21/04 10:45	0.008	14.4	11120	8.30	19.10	6.7	28	<0.02	0.01	4.4	0.15	1.04	0.08	13	<5	28000	20222	49000	<5	<5	<5	<5	<10	<8.0	29	10	15	<2.0	<3.0	<2.0	3066
SCBS@M02	9/28/04 9:30	0.004	14	17128	8.30	19.10	33.7	19	<0.02	0.05	2.32	0.2	1.36	0.11	38	<5	7900	4800	2100	<5	<5	<5	<5	<10	<8.0	31	5.2	16	<2.0	<3.0	<2.0	5496
SCLP@CDC	8/6/03 11:00	DRY																														
SCLP@CDC	8/25/03 9:15	DRY																														
SCLP@CDC	9/8/03 13:30	DRY																														
SCLP@CDC	9/15/03 11:10	DRY																														
SCLP@CDC	9/18/03 9:45	DRY																														
SC@LPCDC	9/23/04 10:53	DRY																														
SCM00P03	5/30/03 11:00	DRY																														
SCM00P03	7/10/03 13:25	DRY																														
SCM00P03	8/27/03 10:21	0.007	13.60	2550	8.19	20.93	2.77	24.0	<0.02	0.01	0.4	0.65	0.27	0.08	30	<5.0	89000	42000	10800	<5.0	<5.0	<5.0	<5.0		<8.0	15	12	62	<2.0	<1.0	<2.0	1212
SCM00P03	5/13/04 0:00	DRY																														
SCM00P03	8/12/04 11:45	0	8.07	5662	7.75	21.72			<0.02	0.06	2.4	0.35	0.69		<5	<5				<5	<5	<5	<5	<10	<8.0	18	6.5	39	<2.0	<3.0	<2.0	1296
SCM00P03	9/2/04 11:00	0	4.18	5653	7.58	22.32	1.6	26	<0.02	0.17	2.1	0.15	0.74	0.04	<5	<5	27000	17800	1400	<5	<5	<5	<5	<10	<8.0	19	8.2	36	<2.0	<1.0	<2.0	1660
SCM00P05	5/30/03 11:44	0.012	23.65	6771	9.01	21.65	3.14	21.0	<0.02	0.04	0.3	0.14	0.21	0.07	10	<5.0	1700	265	2500	<5.0	<5.0	<5.0	<5.0		<8.0	20	11	32	<2.0	<1.0	<2.0	630
SCM00P05	7/10/03 11:30	0.011	8.56	5468	8.64	21.36	4.37	22.0	<0.02	0.22	2.8	<0.05	0.44	0.02	34	<5.0	6550	1300	1400	<5.0	<5.0	<5.0	<5.0		<8.0	15	8.7	51	<2.0	<1.0	<2.0	591
SCM00P05	8/27/03 11:00	0.002		6280	9.07	20.55	2.34	26.0	<0.02	<0.01	1.8	0.2	0.06	0.13	6	<5.0	17000	14000	2900	<5.0	<5.0	<5.0	<5.0		<8.0	10	9.3	13	<2.0	<1.0	<2.0	1408
SCM00P05	5/13/04 0:00	DRY																												3		
SCM00P05	5/27/04 1:00	0	7.98	6150	7.41	20.92	7.05	26	<0.02	0.07	1.6	0.12	0.89	0.08	24	<5	9100	7800	3500	17.5	<5	<5	<5	<10	<8.0	18	3.7	42	<2.0	<3.0	<2.0	1528
SCM00P05	7/9/04 11:30																															
SCM03P01	8/15/03 9:33	0.432	7.86	1933	7.44	20.92	17.6	26.0	<0.02	0.01	2.0	<0.05	0.53	0.29	18	<5.0	94000	56000	2950	600	<5.0	<5.0	<5.0		<8.0	22	8	35	<2.0	3.3	<2.0	544
SCM03P01	8/22/03 9:45	n/a	7.08	1864	7.80	21.61	4.88	24.5	<0.02	0.09	3.2	0.15	1.98	0.01	17	<5.0	59000	5000	3200	179	<5.0	<5.0	<5.0		<8.0	17	8.4	19	<2.0	2	<2.0	562
SCM03P01	9/8/03 10:28	0.444	7.83	1823	7.47	20.50	6.94	28.0	<0.02	0.091	1.1	0.1	0.41	0.11	<5.0	<5.0	4500	3200	5900	37	<5.0	<5.0	118		<8.0	26	9.2	53	<2.0	4.3	<2.0	588
SCM03P01	7/15/04 10:30	0	7.67	2506	7.34	20.64	3.07	31	<0.02	<0.01	2.6	<0.05	1.24	0.07	14	<5	8000	2800	6000	16.7	<5	<5	<5	<10	<8.0	37	9.3	63	<2.0	<3.0	<2.0	784
SCM03P01	8/13/04 10:15	0.048	9.34	1770	8.30	19.18	4.79		<0.02	0.05	1.5	0.1	1.24	0.05	10	<5	84000	49000	58000	<5	<5	<5	<5	<10	<8.0	14	7	21	<2.0	<1.0	<2.0	568
SCM03P01	9/8/04 0:00	0	6.53	1769	7.33	20.53	1.59		<0.02	0.06	2.5	0.1	1.53	0.1	<5	<5	3200	1400	1080	16.4	<5	2390	<5	<10	<8.0	30	9	54	<2.0	5.9	<2.0	732
SJC@WAA	7/23/03 11:00	DRY																														
SJC@WAA	8/19/03 8:30	DRY																														
SJC@WAA	9/3/03 14:00	DRY																														
SJC@WAA	9/15/03 13:23	DRY																														
SJC@WAA	9/18/03 9:48	DRY																														
SJC@WAA	9/23/04 11:09	DRY																														
SJCL01@CC	7/23/03 11:00	0.001	10.88	767	8.41	22.80	2.40	30.4	<0.02	0.04	0.8	<0.05	0.82	0.03	<5.0	<5.0	2070	725	580	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	5	56	<2.0	<1.0	<2.0	166
SJCL01@CC	8/19/03 10:16	0.006	10.20	369	7.62	22.67	5.43		<0.02	0.08	6.4	<0.05	1.22	0.01	<5.0	<5.0	39000	960	1030	<5.0	<5.0	<5.0	<5.0		<8.0	6.9	13	370	<2.0	<1.0	6.1	208
SJCL01@CC	9/4/03 12:30	0.006	8.69	691	7.82	23.76	1.14	30.0	<0.02	0.01	1.7	<0.05	0.44	0.06	<5.0	<5.0	1130	980	960	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	3.5	17	<2.0	<1.0	<2.0	308
SJCL01@CC	9/15/03 11:22	0.054	7.60	745	8.21	23.77	6.72	24.6	<0.02	<0.05	0.8	0.18	0.16	0.3	<5.0	<5.0	8200	4300	6100	468	<5.0	<5.0	<5.0		<8.0	<4.0	12	42	<2.0	<1.0	<2.0	216
SJCL01@CC	9/18/03 13:28	0.028	9.70	769	8.29	23.11	0.88	30.3	<0.02	<0.01	0.9	<0.05	0.17	0.04	<5.0	<5.0	8700	3300	3900	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2.2	15	<2.0	<1.0	<2.0	226
SJCL01@CC	7/1/04 11:20	0.001	10.23	1036	8.51	24.44	3.05	29	<0.02	0.2	1.2	0.24	1.43	0.05	6	<5	79000	72000	2800	<5	<5	<5	<5	<10	<8.0	5.3	12	80	<2.0	<1.0	2.2	298
SJCL01@CC	8/4/04 10:45	0.001	4.24	775	7.84	21.95	10.9		<0.02	0.11	1.3	0.15	1.68	0.02	23	<5	4700	3300	1290	<5	<5	<5	<5	<10	<8.0	6.2	10	88	<2.0	<1.0	<2.0	240
SJCL01@CC	9/14/04 9:45	0.005	9.51	1024	8.36	22.21	1.95		<0.02	<0.01	0.8	0.15	1.03	0.12	6	<5	11400	8900	1210	<5	<5	<5	<5	<10	<8.0	5.1	7.2	40	<2.0	<1.0	<2.0	276
SJCL01@CC	9/21/04 14:00	0.005	14.6	870	8.20	26.80	6.4	32	<0.02	0.43	<0.1	0.1	3.85	0.06	20	<5	73000	58000	87000	<5	<5	<5	<5	<10	<8.0	23	9.2	37	<2.0	<3.0	<2.0	250
SJCL01@CC	9/28/04 12:30	0.016	13.8	855	8.60	21.80	15.9	26	<0.02	0.02	<0.1	0.9	3.87	0.14	86	<5	62000	50000	53000	<5	<5	<5	<5	<10	<8.0	7.1	10	150	<2.0	<3.0	<2.0	402

Site Name	Date/Time	Discharge Rate	Dissolved Oxygen	Specific Conductance	pH	Water Temperature	Turbidity	Air Temperature	Phenols	Ammonia as N	Nitrate + Nitrite as N	Surfactsnats (MBAS)	Reactive Phosphorous	Total Chlorine	Total Suspended Solids (TSS)	Oil & Grease	Total Coliform	Fecal Coliform	Enterococcus	Diazinon	Chlorpyrifos	Malathion	Dimethoate	Disulfoton	Dissolved Metals							Hardness as $CaCO_3$
																									Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	
		cfs	mg/L	µS/cm		^0C	NTU	^0C	mg/L								CFU/100mL			ng/L					µg/L							mg/L
SJCL01P03	6/23/03 11:15	0.216	8.62	3010	8.28	18.66	3.96	18.8	<0.02	0.04	6.0	<0.05	0.63	0.24	13	<5.0	29000	17000	13750	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	15	19	<2.0	<1.0	<2.0	570
SJCL01P03	8/15/03 11:39	1.350	8.23	3345	8.02	21.84	9.74	26.0	<0.02	0.02	2.8	<0.05	0.61	0.12	<5.0	<5.0	24000	6550	5450	118	<5.0	<5.0	<5.0		<8.0	<4.0	6.2	96	<2.0	<1.0	<2.0	796
SJCL01P03	9/4/03 11:45	0.042	8.47	1890	8.33	22.23	2.43		<0.02	0.2	7.0	<0.05	0.88	0.04	<5.0	<5.0	7100	6200	6500	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	4.1	19	<2.0	<1.0	<2.0	840
SJCL01P03	7/9/04 12:45	0.064	9.72	2538	8.36	20.75	3.6	28	<0.02	0.09	2.5	0.08	1.02	0.06	<5	<5	12400	9750	5200	<5	<5	<5	<5	<10	<8.0	8.2	5.8	44	<2.0	<1.0	<2.0	758
SJCL01P03	7/23/04 13:00	0.060	7.57	3105	8.23	22.30	3.17	25	<0.02	0.04	5.6	0.05	1.03	0.05	<5	<5	52000	44000	10000	11.5	<5	<5	<5	<10	<8.0	6.6	7.5	75	<2.0	<1.0	<2.0	720
SJCL01P03	9/1/04 13:30	0.080	10.32	2762	8.01	22.52	7.03	26	<0.02	0.1	5.6	<0.05	1	0.05	<5	<5	15200	11600	17000	120	<5	695	<5	<10	<8.0	5.7	12	25	<2.0	<1.0	<2.0	836
SJCL01S02	7/18/03 9:43	0.350	7.87	5748	7.80	20.80	3.63	21.0	<0.02	0.02	4.1	0.33	0.49	0.04	<5.0	<5.0	69000	18000	8100	<5.0	<5.0	<5.0	<5.0		<8.0	180	4.6	90	<2.0	13	<2.0	620
SJCL01S02	8/18/03 9:58	1.080	11.17	6700	7.27	21.50	6.90		<0.02	<0.01	2.1	<0.05	0.05	0.11	57	<5.0	21000	16000	28000	<5.0	<5.0	<5.0	<5.0		<8.0	170	3	66	<2.0	20	<2.0	2304
SJCL01S02	9/3/03 11:00	0.896	8.97	5805	7.48	20.36	4.46	26.0	<0.02	0.15	4.3	0.05	0.24	0.03	7	<5.0	126000	57000	8600	265	<5.0	<5.0	<5.0		<8.0	140	5	71	<2.0	6.5	<2.0	1140
SJCL01S02	9/15/03 12:22	0.732	4.59	6330	7.58	21.11	3.74	28.9	<0.02	0.066	1.5	0.18	0.08	0.14	6	<5.0	46000	23000	33000	<5.0	<5.0	<5.0	<5.0		<8.0	140	4.7	63	<2.0	5.3	<2.0	2246
SJCL01S02	9/23/03 10:00	3.180	9.02	5487	7.55	21.22	3.63	20.0	<0.02	0.05	4.1	0.3	0.29	0.04	18	<5.0	73000	22000	47000	<5.0	<5.0	<5.0	<5.0		<8.0	170	3.2	100	<2.0	13	<2.0	
SJCL01S02	5/27/04 11:30	0.613	13.36	6528	7.75	17.90	2.32	26	<0.02	0.11	4.7	0.08	0.34	0.07	10	<5	10600	6300	4300	<5	<5	<5	<5	<10	12	190	8.4	110	<2.0	3	4.5	2284
SJCL01S02	7/23/04 0:00	4.620	8.08	5946	7.77	21.62	2.94	28	<0.02	0.8	3.8	<0.05	0.44	0.04	<5	<5	28000	20000	12400	5.4	<5	<5	<5	<10	<8.0	150	5.5	92	<2.0	8.1	<2.0	1520
SJCL01S02	9/1/04 11:50	0.172	11.34	5619	7.66	20.47	2.82	24	<0.02	0.01	4.7	<0.05	0.28	0.02	<5	<5	2900	2200	810	30.7	<5	<5	<5	<10	<8.0	160	10	56	<2.0	9.2	<2.0	2340
SJCL01S02	9/21/04 11:55	0.240	14.7	6970	7.80	19.50	2.1		<0.02	0.01	5	<0.05	0.4	0.04	<5	<5	4600	3300	4100	316	<5	<5	<5	<10	<8.0	250	3.7	68	<2.0	3	<2.0	2890
SJCL01S02	9/28/04 10:15	0.158	13.1	3381	7.90	19.80	2.7	21	<0.02	0.08	5.4	0.1	0.45	0.05	<5	<5	76000	44000	66000	46.3	<5	<5	<5	<10	<8.0	220	2.9	88	<2.0	3	<2.0	2776
SJCL01S03	8/6/03 13:00	DRY																														
SJCL01S03	8/19/03 12:07	0.170	11.38	7127	8.02	22.29	2.63	31.0	<0.02	0.03	7.8	0.15	0.66	0.09	<5.0	<5.0	61000	14300	1130	9740	<5.0	<5.0	<5.0		<8.0	5	5	82	<2.0	<1.0	<2.0	888
SJCL01S03	9/4/03 10:30	0.066	7.93	7020	8.22	21.31	3.37	27.5	<0.02	<0.01	6.1	<0.05	0.62	0.05	7	<5.0	30000	22000	42000	409	<5.0	<5.0	<5.0		<8.0	8.1	7.1	23	<2.0	<1.0	<2.0	1370
SJCL01S03	9/16/03 11:09	0.080	1.13	8377	8.25	20.10	4.29	27.2	<0.02	<0.05	2.1	0.19	0.11	0.12	10	<5.0	19900	10500	14900	<5.0	<5.0	<5.0	<5.0		<8.0	4.5	9.4	38	<2.0	<1.0	<2.0	3148
SJCL01S03	9/19/03 9:00	0.106	9.87	8514	8.30	19.94	4.46	26.0	<0.02	0.01	8.6	0.07	0.24	0.08	17	<5.0	44000	14400	14200	<5.0	<5.0	<5.0	<5.0		<8.0	5.9	3.4	17	<2.0	<1.0	<2.0	1220
SJCL01S03	5/27/04 0:00	0.000	7.6	7739	8.10	17.83	0.56	21	<0.02	0.02	8.5	0.1	0.42	0.07	<5	<5	1590	860	460	<5	<5	<5	<5	<10	<8.0	9.9	7.9	35	<2.0	<3.0	2.9	2570
SJCL01S03	7/23/04 9:45	0.010	8.37	7476	8.19	21.48	1.79	25	<0.02	0.03	7.8	0.05	0.45	0.03	8	<5	21400	16000	6300	<5	<5	<5	<5	<10	<8.0	11	6.5	31	<2.0	<1.0	<2.0	1176
SJCL01S03	9/1/04 10:45	0.000	11.33	6122	7.95	20.89	2.84	26	<0.02	<0.01	7.6	0.1	0.2	0.03	19	<5	6300	4400	1670	<5	<5	<5	<5	<10	<8.0	11	6.7	20	<2.0	<1.0	<2.0	1818
SJCL01S03	9/21/04 12:40	0.020	15.2	6725	8.40	21.90	2.9	32	<0.02	<0.01	7	<0.05	0.47	0.04	10	<5	14200	11000	5500	<5	<5	<5	<5	<10	<8.0	13	3.3	<10	<2.0	<3.0	<2.0	2490
SJCL01S03	9/28/04 11:00	0.010	15.9	6730	8.55	20.20	1.41	23	<0.02	<0.01	7.1	0.2	0.4	0.09	<5	<5	46000	38000	9950	<5	<5	<5	<5	<10	<8.0	14	4.2	22	<2.0	<3.0	<2.0	2540
SJCL02P02	6/23/03 13:49	0.026	7.08	1302	7.99	18.15	6.31	19.8	<0.02	0.99	0.9	0.2	2.9	0.07	<5.0	<5.0	87000	42000	50660	<5.0	<5.0	<5.0	<5.0		<8.0	4.9	8.5	36	<2.0	<1.0	<2.0	440
SJCL02P02	8/15/03 13:06	0.032	4.61	1274	7.46	22.83	19.4	26.0	<0.02	0.01	2.1	<0.05	2.01	0.18	15	<5.0	98000	41000	3450	<5.0	<5.0	<5.0	<5.0		24	35	77	2900	<2.0	3.2	16	2000
SJCL02P02	9/3/03 9:15	0.032	7.46	1006	7.50	21.23	3.76	26.0	<0.02	0.19	2.9	0.17	1.43	0.04	<5.0	<5.0	81000	36000	66000	135	<5.0	<5.0	<5.0		<8.0	4.3	11	41	<2.0	<1.0	<2.0	412
SJCL02P02	7/1/04 9:45	0.002	7.27	1238	7.95	19.38	2.89	24	<0.02	0.24	1.3	0.16	1.81	0.04	6	<5	18500	12600	8450	<5	<5	<5	<5	<10	<8.0	6.9	22	190	<2.0	<1.0	<2.0	312
SJCL02P02	8/4/04 10:06	0.020	6.56	1172	8.05	20.72	3.96		<0.02	0.17	0.8	0.33	2.25	0.02	9	<5	>200000	110000	76000	<5	<5	<5	<5	<10	<8.0	6.4	10	84	<2.0	<1.0	<6.2	328
SJCL02P02	9/14/04 10:45	0.030	5.26	1298	7.55	21.29	12.4		<0.02	0.29	0.9	0.6	2.97	0.07	30	<5	>200000	58000	170000	881	<5	<5	<5	<10	<8.0	7.9	5.9	69	<2.0	<1.0	<2.0	320
SJCL05@L01	7/23/03 10:00	n/a	7.94	2128	8.10	22.10	6.23	22.5	<0.02	0.04	1.4	0.15	1.24	0.05	12	<5.0	11600	1810	2950	<5.0	<5.0	<5.0	<5.0		<8.0	9	5.6	16	<2.0	<1.0	<2.0	446
SJCL05@L01	8/19/03 11:31	n/a	10.99	905	7.94	22.26	4.38		<0.02	<0.01	2.1	<0.05	0.22	0.06	7	<5.0	23000	1490	1630	<5.0	<5.0	<5.0	7460		<8.0	9.3	4.6	19	<2.0	<1.0	<2.0	734
SJCL05@L01	9/3/03 10:15	n/a	9.72	2703	7.58	22.90	8.72	28.0	<0.02	0.64	1.1	0.15	1.24	<0.01	12	<5.0	4700	4100	1020	<5.0	<5.0	<5.0	<5.0		<8.0	8.3	2.7	16	<2.0	<1.0	<2.0	736
SJCL05@L01	9/15/03 9:59	n/a	4.02	2327	8.22	20.56	10.30	24.2	<0.02	<0.05	0.8	0.18	0.17	<0.01	15	<5.0	5600	2100	6300	<5.0	<5.0	<5.0	<5.0		<8.0	8.9	7.6	34	<2.0	<1.0	<2.0	804
SJCL05@L01	9/18/03 14:34	n/a	9.54	1208	8.45	21.97	11.80	30.3	<0.02	<0.01	0.7	0.2	0.13	0.08	13	<5.0	5100	620	1060	<5.0	<5.0	<5.0	<5.0		<8.0	<4.0	2.3	12	<2.0	<1.0	<2.0	388
SJCL05@L01	7/1/04 10:30	n/a	9.8	3354	8.45	19.28	4.14	27	<0.02	0.02	1.8	<0.05	0.48	0.04	14	<5	2600	2000	1390	<5	<5	<5	<5	<10	<8.0	21	5.7	42	<2.0	<1.0	<2.0	1206
SJCL05@L01	8/4/04 11:45	n/a	9.41	2509	8.52	21.53	12.2		<0.02	0.13	5.7	0.13	1.13	0.1	28	<5	12400	3000	7200	21.5	<5	<5	<5	<10	<8.0	23	6	33	<2.0	<1.0	<2.0	924
SJCL05@L01	9/14/04 11:30	n/a	9.44	3056	8.24	21.36	9		<0.02		7.8	0.25	1.01	0.03	18	<5	7200	4800	5100	16.6	<5	<5	<5	<10	<8.0	23	6.3	34	<2.0	<1.0	<2.0	1036
SJCL05@L01	9/21/04 0:00	n/a													13	<5	4600	3900	4300	<5	<5	<5	<5	<10	<8.0	22	2.9	<10	<2.0	<3.0	<2.0	
SJCL05@L01	9/28/04 13:10	n/a	14.9	2531	8.80	21.20	7.7	24	<0.02	0.25	1.3	<0.05	1.18	0.04	10	<5	3600	2200	3800	<5	<5	<5	<5	<10	<8.0	24	3.5	18	<2.0	<3.0	<2.0	1000
	Mean-Random		8.94	2531	7.85	21.10	11.59	27.01	0.02	0.25	2.56	0.16	1.67	0.07	17.74	5.02	39705	21135	23056	191.46	5.00	93.56	79.84	10.50	8.74	28.46	13.34	67.07	2.00	4.72	2.17	739
	StdDev-Random		2.17	1885	0.43	2.01	38.63	4.40	0.00	0.60	1.77	0.24	2.02	0.10	46.99	0.22	46957	30464	44860	727.7	0.00	611.9	882.0	4.66	8.57	73.58	39.89	220	0.00	13.81	1.20	645
	Mean + 3.9 sd		17.42	9883	9.54	28.93	162.2	44.16	0.02	2.59	9.45	1.11	9.54	0.47	201.01	5.89	222839	139943	198009	3029	5.00	2480	3520	28.7	42.16	315.4	168.9	925	2.00	58.6	6.87	3255
	Geomean-All																19190	8691	7478													
	Mean-All		8.86	2863	7.88	21.46	16.95	27.16	0.02	0.32	2.82	0.19	1.63	0.07	23.20	5.00	49218	25825	22809	181.04	5.17	64.84	85.05	10.25	8.38	27.47	11.77	59.61	2.00	3.52	2.12	839
	Maximum-All		24	19370	9.12	29	1000	39.00	0.02	6.44	10.60	3.34	23.10	1.19	1580	9.00	1040000	200000	416000	9740	32.1	7170	11800	53.50	120	760	520	2900	2.00	110	16.0	6900
	Minimum-All		1.11	287.00	6.45	16.60	0.18	17.00	0.02	0.01	0.00	0.01	0.01	0.01	5.00	0.60	10.00	10.00	10.00	5.00	5.00	5.00	5.00	10.00	8.00	4.00	2.00	10.00	2.00	1.00	2.00	119.00
	90th %tile-All		11.93	6150	8.32	23.59	16.86	33.00	0.02	0.92	5.98	0.40	2.89	0.13	32.40	5.00	119400	66200	53000	310.0	5.00	24.40	5.00	10.0	8.0	75.5	18.0	91.0	2.00	4.32	2.00	1522

Attachment C-11-VII

Data from Quality Assurance Sample Analyses

Analyses of Synthetic Samples for Nutrients and Trace Metals

Nutrient Analyses

FRESHWATER

Date	Sample #	Lab	NO_3 mg/L	NH_3-N mg/L	TKN mg/L	PO_4 mg/L
8/12/03	WR61361	Mont.-Wat.	37	1.32	1.2	1.84
	True Value		36.47	1.31	1.31	1.74
	difference		0.53	0.01	-0.11	0.10
	% recovery		101	101	92	106
8/29/03	WR62419	Mont.-Wat.	0.84	0.29	0.74	0.368
	True Value		0.73	0.26	0.73	0.35
	difference		0.11	0.03	0.01	0.02
	% recovery		115	112	101	105
9/17/03	WR62950	Mont.-Wat.	35	0.697	3.2	3.38
	True Value		36.47	0.65	2.99	3.49
	difference		-1.47	0.05	0.21	-0.11
	% recovery		96	107	107	97
9/23/03	WR63189	Mont.-Wat.	9.7	0.695	1.2	1.81
	True Value		9.12	0.65	1.12	1.74
	difference		0.58	0.04	0.08	0.07
	% recovery		106	107	107	104
10/30/03	WR64488	Mont.-Wat.	0.75	0.27	0.77	0.276
	True Value		0.73	0.26	0.73	0.35
	difference		0.02	0.01	0.04	-0.07
	% recovery		103	104	105	79
11/1/03	WR644497	Mont.-Wat.	18	1.35	1.1	1.78
	True Value		18.23	1.31	1.31	1.74
	difference		-0.23	0.04	-0.21	0.04
	% recovery		99	103	84	102
11/5/03	WR64600	Mont.-Wat.	9.2	0.695	1	2.06
	True Value		9.12	0.65	1.12	1.74
	difference		0.08	0.04	-0.12	0.32
	% recovery		101	107	89	118
11/13/03	WR64946	Mont.-Wat.	9.7	1.37	1.8	3.68
	True Value		9.12	1.31	1.78	3.49
	difference		0.58	0.06	0.02	0.19
	% recovery		106	105	101	105
2/4/04	WR62950	Mont.-Wat.	2	0.292	3	0.246
	True Value		1.82	0.26	2.6	0.35
	difference		0.18	0.03	0.40	-0.10
	% recovery		110	112	115	70
2/6/04	WR68126	Mont.-Wat.	4	0.28	1.3	0.276
	True Value		3.65	0.26	1.19	0.35
	difference		0.35	0.02	0.11	-0.07
	% recovery		110	108	109	79
2/7/04	WR68140	Mont.-Wat.	4	0.277	1.2	0.338
	True Value		3.65	0.26	1.19	0.35
	difference		0.35	0.02	0.01	-0.01
	% recovery		110	107	101	97
2/27/04	WR69407	Mont.-Wat.	9.2	0.678	0.94	1.78
	True Value		9.12	0.65	1.12	1.74
	difference		0.08	0.03	-0.18	0.04
	% recovery		101	104	84	102

SEAWATER

Date	Sample #	Lab	NO_3 mg/L	NH_3-N mg/L	TKN mg/L	PO_4 mg/L
7/15/03	WR60269	Mont.-Wat.	3.9	0.337	0.92	1.74
	True Value		3.65	0.26	1.19	1.74
	difference		0.25	0.08	-0.27	0.00
	% recovery		107	130	77	100
9/3/03	WR62247	Mont.-Wat.	9.2	1.36	1.7	1.81
	True Value		9.12	1.31	2.24	1.74
	difference		0.08	0.05	-0.54	0.07
	% recovery		101	104	76	104
9/26/03	WR63189	Mont.-Wat.	3.9	0.694	0.5	0.645
	True Value		3.65	0.65	0.65	0.7
	difference		0.25	0.04	-0.15	-0.05
	% recovery		107	107	77	92
10/23/03	WR64162	Mont.-Wat.	9.7	1.35	2.3	1.81
	True Value		9.12	1.31	2.24	1.74
	difference		0.58	0.04	0.06	0.07
	% recovery		106	103	103	104
6/2/04	WR73978	Mont.-Wat.	1.8	0.3	0.51	0.645
	True Value		1.82	0.26	0.73	0.7
	difference		-0.02	0.04	-0.22	-0.05
	% recovery		99	115	70	92

Analyses of Synthetic Samples for Nutrients and Trace Metals

Trace Metal Analyses

Date	Sample #	Lab	Cd µg/L	Cr µg/L	Cu µg/L	Pb µg/L	Ni µg/L	Ag µg/L	Zn µg/L
8/18/03	WR61478	Weck	11	40	9	12	24	12	40
	True Value		12	40	12	12	25	12	40
	difference		-1.00	0.00	-3.00	0.00	-1.00	0.00	0.00
	% recovery		92	100	75	100	96	100	100
9/17/03	WR62948	Weck	23	94	27	24	96	23	97
	True Value		25	100	25	25	100	25	100
	difference		-2.00	-6.00	2.00	-1.00	-4.00	-2.00	-3.00
	% recovery		92	94	108	96	96	92	97
10/15/03	WR63913	Weck	9	31	9	9	90	8	50
	True Value		10	40	10	10	100	10	50
	difference		-1.00	-9.00	-1.00	-1.00	-10.00	-2.00	0.00
	% recovery		90	78	90	90	90	80	100
11/3/03	WR64520	Weck	5	26	5.3	5.2	26	4.6	28
	True Value		5	25	5	5	25	5	30
	difference		0.00	1.00	0.30	0.20	1.00	-0.40	-2.00
	% recovery		100	104	106	104	104	92	93
11/12/03	WR64703	Weck	13	41	14	13	101	13	46
	True Value		15	50	15	15	120	15	50
	difference		-2.00	-9.00	-1.00	-2.00	-19.00	-2.00	-4.00
	% recovery		87	82	93	87	84	87	92
11/12/03	WR64939	Weck	15	50	16	17	110	15	47
	True Value		15	50	15	15	120	15	50
	difference		0.00	0.00	1.00	2.00	-10.00	0.00	-3.00
	% recovery		100	100	107	113	92	100	94
12/9/03	WR64521	Weck	24	91	26	19	89	22	104
	True Value		25	100	25	25	100	25	100
	difference		-1.00	-9.00	1.00	-6.00	-11.00	-3.00	4.00
	% recovery		96	91	104	76	89	88	104
2/4/04	WR67882	Weck	48	100	49	53	59	53	100
	True Value		50	100	50	50	50	50	100
	difference		-2.00	0.00	-1.00	3.00	9.00	3.00	0.00
	% recovery		96	100	98	106	118	106	100
2/4/04	WR67883	Weck	48	92	44	46	55	48	95
	True Value		50	100	50	50	50	50	100
	difference		-2.00	-8.00	-6.00	-4.00	5.00	-2.00	-5.00
	% recovery		96	92	88	92	110	96	95
2/7/04	WR68303	Weck	9.7	30	11	7.8	93	10	51
	True Value		10	40	10	10	100	10	50
	difference		-0.30	-10.00	1.00	-2.20	-7.00	0.00	1.00
	% recovery		97	75	110	78	93	100	102
2/26/04	WR69407	Weck	13	54	16	16	120	16	48
	True Value		15	50	15	15	120	15	50
	difference		-2.00	4.00	1.00	1.00	0.00	1.00	-2.00
	% recovery		87	108	107	107	100	107	96
4/14/04	WR716554	Weck	12	36	12	12	25	11	38
	True Value		12	40	12	12	25	12	40
	difference		0.00	-4.00	0.00	0.00	0.00	-1.00	-2.00
	% recovery		100	90	100	100	100	92	95
6/1/04	WR64521	Weck	24	110	27	24	95	23	97
	True Value		25	100	25	25	100	25	100
	difference		-1.00	10.00	2.00	-1.00	-5.00	-2.00	-3.00
	% recovery		96	110	108	96	95	92	97