1. Title and Approval Page

WISHTOYO FOUNDATION
VOLUNTEER MONITORING
QUALITY ASSURANCE PROJECT PLAN

PREPARED BY:
WISHTOYO FOUNDATION
refer correspondence to:
Leigh Ann Grabowsky
1591 Spinnaker Dr. Suite 203
Ventura, CA 93001

Approvals:

Los Angeles Regional Water Quality Control Board – Jau Ren Chen

Signature: Jau Ren Chen Date: Feb. 7, 2006

Los Angeles Regional Water Quality Control Board – Macaria Flores, Project Manager

Signature: Macaria Flores Date: Feb. 7, 2006

Wishtoyo Foundation – Leigh Ann Grabowsky, Program Director and Quality Assurance Officer

Signature: [signature] Date: 1 Feb 06

CRG Marine Laboratories – Rich Gossett, Laboratory Manager

Signature: [signature] Date: 23 Jan 06

Wishtoyo Foundation – Mati Waiya, Executive Director

Signature: Mati Waiya Date: 1 Feb 06

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3. Distribution List

Copies of this Quality Assurance Project Plan (QAPP), and any approved revisions of this plan, will be distributed to the following individuals:

- Leigh Ann Grabowsky, Program Director and Field Team Leader (805)453-3000
- Darla Wise (805)654-3942, Allen Leydecker (805)569-1748, and Mark Abramson (310)453-0395, Technical Advisors
- Macaria Flores, Project Manager, Los Angeles Regional Water Quality Control Board (213)576-6761
- Rich Gossett, Laboratory Manager, CRG Marine Laboratories (310)533-5190
- Erick Burres, State Water Resources Control Board's Clean Water Team (213)576-6788
- Jau Ren Chen, QA Officer, Los Angeles Regional Water Quality Control Board (213) 576-6656

Once approved, this QAPP will be available to any interested parties by requesting a copy from **the project management**.

4. Project Organization

The Wishtoyo Foundation Stream Team Volunteer Monitoring Project will monitor and assess natural streams, storm drains, lagoon, and estuary in Calleguas Creek Watershed. Wishtoyo Program Director, Leigh Ann Grabowsky, shall act as director of this monitoring project, and will oversee quality assurance, data management, training of citizen monitors, field monitoring, and consultation with the Technical Advisory Committee. Technical Advisory Committee members include:

- Darla Wise, Stormwater Engineer, Ventura County Watershed Protection District
- Allen Leydecker, Researcher, University of California at Santa Barbara
- Mark Abramson, Stream Team Manager, Heal the Bay

Wishtoyo shall work with Macaria Flores, Project Manager of the Los Angeles Regional Water Quality Control Board to ensure adherence to our proposal and contract. Several other resource agencies, such as the Ventura County Watershed Protection District, have assisted in the development of this project from its conception. Additional partnerships will be developed to ensure adequate technical support to all participating volunteer monitoring groups. This QAPP has been adapted from the approved QAPP (10/27/03) developed by SCMI and from QA/QC guidelines in the Calleguas Creek Watershed Metals and Toxicity Sampling and Analysis Plans.

5. Problem Definition/Background

5.1 Problem Statement

Various reaches within the Calleguas Creek Watershed, in southern Ventura County, California, appear on the 2002 Clean Water Act Section 303(d) list of water quality limited segments as impaired due to water column and sediment toxicity, organophosphate pesticides in water, and chlorpyriphos in fish tissue. Three reaches within this watershed appear on the 303(d) list as impaired due to water column concentrations of metals. Several reaches are in the 303(d) list as impaired due to nutrients, ammonia, and algae. Total Maximum Daily Load (TMDL) implementation and monitoring plans are being developed.

No volunteer monitoring organizations existed in the Calleguas Creek Watershed prior to the Wishtoyo Foundation's involvement in citizen monitoring efforts. There had been little or no previous coordination between organizations and agencies regarding sampling methods, parameters, sampling locations, data sharing, and other aspects. Education and coordination between all citizen monitors and regulatory agencies is necessary to provide valuable data and to maximize the results of monitoring efforts. The Wishtoyo Foundation/Ventura Coastkeeper will coordinate citizen monitoring group efforts by holding

training sessions, Quality Assurance/Quality Control (QA/QC) sessions, helping with data collection and upload to the state water board, and any other aspect that becomes necessary to maximize efficiency between groups.

5.1.1. Citizen Monitoring and Goals

5.1.1.1 Mission

The mission of this citizen monitoring program is to produce environmental information which is needed to protect the Calleguas Creek Watershed and aquatic resources. Citizen monitoring will also inform and engage the community in effective watershed stewardship.

5.1.1.2 Program Goals

- To provide an illustrated field guide for sampling and analysis performed by citizen monitors. This field guide will be patterned after the model provided by the Heal the Bay Stream Team Field Guide.

- To encourage and increase public involvement, and to standardize data quality from citizens in citizen monitoring programs.
- To expand and coordinate seasonal water monitoring "snapshot" efforts. The existing citizen monitoring effort within Region 4 of the State Water Resources Control Board (SWRCB) would be restructured and expanded in order to assess and report water quality on the same day in all the region's watersheds, which includes the Calleguas Creek watershed.

- To assist groups in data entry and transmittal, thereby assisting the Los Angeles Regional Water Quality Control Board (LARWQCB) staff in their water quality assessment and Total Maximum Daily Load (TMDL) efforts. All credible data collected by participating citizen groups and lead agency, in all of the local watersheds will be entered on a Microsoft Excel database and transmitted to the LARWQCB via email.

- To increase public awareness and stewardship of our water resources, thereby altering behavior and unsustainable land use practices, and resulting in lower pollution levels over time.

5.2. Intended Usage of Data

The data will be used by the Wishtoyo Foundation for general watershed assessment purposes. Assessment of this data will be useful in providing information for watershed management and pollution prevention. The data will be made public for watershed education. It will also be made available to regulatory and resource management agencies to supplement their existing data collection efforts. One potential application of the data will be to provide information to the Regional and State Boards for their use, if they so choose, in Clean Water Act Section 305(b) reporting.

Data will be collected and shared with the State Water Resources Control Board, the LARWQCB, and upon request to other state, federal, and local agencies and organizations. The main database will be maintained at the Wishtoyo Foundation, 3600 So. Harbor Blvd., Suite 222, Oxnard, Ca 93035.

6. Project/Task Description

6.1. General Overview of Monitoring

The Wishtoyo Foundation is assessing water quality in Ventura County including, but not limited to, Calleguas Creek. This monitoring program will enhance current regional studies. Physical, chemical and biological parameters are measured, although not all parameters will be measured at all sites. A map of monitoring sites is shown in Appendix B. Table 6.1 summarizes the monitoring design, including the physical, chemical and biological parameters to be measured, whether the samples will be analyzed by the monitoring group or sampled for later analysis by a professional lab, and the frequency of measurement.

Pesticides and total and dissolved metals shall be analyzed from water samples. The other constituents shall be analyzed from water samples. Pesticide sampling will be taken from various sites and at various times depending on crop rotations, irrigation schedules, and precipitation.

Table 6.1. Summary of Monitoring Design

Parameter	Type & Frequency
Temperature	F, M
Dissolved Oxygen	F, M
PH	F, M
Conductivity (fresh water) or Salinity (marine)	F, M
Turbidity/ Transparency	F, M
Ammonia	L, M
Nitrate	L, M
Ortho-Phosphate	L, M
Bacteria	L, M
Pesticides	P, S, X
Total and Dissolved Metals	P, X

Codes for Table 6.1:
Type: F: field analysis, L: in-house lab analysis, P: sample only, send to outside professional lab
Frequency: W: weekly, M: monthly, S: seasonal, X: irregular
N/A: parameter not sampled

All of the water quality data will be compared to the Regional Water Quality Control Board Basin Plan.
For results that are not comparable to the Basin Plan we will review those data with our Technical Advisors.
This QAPP only addresses data quality objectives for the following parameters:

Weather and Sensory Observations
Temperature
Dissolved Oxygen
pH
Conductivity
Salinity
Turbidity/Transparency
Pesticides
Ammonia (nitrogen)
Nitrate (nitrogen)
Ortho-Phosphate
Total Coliform Bacteria
E. coli Bacteria
Enterococcus Bacteria
Metals

Chemical, physical, and bacterial parameters will be monitored using protocols outlined in a Field Guide based on Heal the Bay Stream Team Field Guide-hereafter referred to as the Field Guide.

6.2 Project Timetable

Table 6.2 identifies the schedule of major activities associated with this project.

Table 6.2. Project Timetable

Activity	Date
Identify and train monitoring leaders	January 2006
Recruit monitors	January 2006
Obtain and check operation of instruments	Completed
Train monitors	January 2006, ongoing
Initiate monitoring	February 2006
Initiate data entry	March 2006
Produce quarterly progress reports	April 2006, quarterly
Calibration and quality control sessions	January 2006, quarterly
Review data with technical advisors	August 2006, every 6 months
Produce final report	December 2006

7. Data Quality Objectives

This section identifies how accurate, precise, complete, comparable, sensitive, and representative our measurements will be. These data quality objectives were derived by reviewing the QAPPs and performance of other citizen monitoring organizations (e.g. Chesapeake Bay, Texas Watch, Coyote Creek Riparian Station, Southern California Citizen Monitoring Steering Committee, Heal the Bay, Malibu Stream Team), by considering the specifications of the instruments and methods employed, and by considering the utility of the data. For purposes of this QAPP the data quality is considered adequate for the determination of general water quality conditions, with a potential application of the data to Section 305(b) reporting purposes.

Data Quality Objectives (DQOs) are summarized in Tables 7-1 to 7-3. Appendix G includes laboratory detection limits and objectives for metals and pesticides for water samples. The laboratory analysis in Appendix E is covered by the Quality Assurance Program in Appendix G. Appendix G fulfills the QAPP requirement for pesticides and metals analyses mentioned in Section 6. Whenever possible the methods with the greatest sensitivity and lowest detection limit will be employed as the primary methods. Methods with lesser sensitivity and higher detection limits will be used for field confirmations or as back-up methods in the case that the primary methods are not available or functioning properly for a particular sampling event.

Table 7.1. Data Quality Objectives for Conventional Water Quality Parameters

Parameter	Method/Range	Units	Detection Limit	Sensitivity *	Precision	Accuracy	Completeness
Temperature	Thermometer (-5 to 50)	^{o}C	-5	0.5 ^{o}C	± 0.5 ^{o}C	± 0.5 ^{o}C	80%
Dissolved oxygen	Electronic meter/probe	mg/l	0.1 mg/l	0.1 mg/l	± 10%	± 10%	80%
pH	pH meter	pH units	2.0	0.1 unit	± 0.2 units	± 0.2 units	80%
Conductivity	conductivity meter	µS/cm	10	10 µS/cm	± 10%	± 10%	80%
Salinity	Electronic meter/probe	ppt	0.1	0.1 ppt	± 10%	± 10%	80%
Turbidity/ Transparency	Nephelometer	NTUs	0.1	0.1	± 10%	± 10%	80%
	Secchi Disk	Secchi Depth	0.1 m	0.1 m	± 0.1 m	± 0.1 m	80%

Table 7.2. Data Quality Objectives for Nutrients Using Colorimeters or Spectrophotometers

Parameter	Method/Range	Units	Detection Limit	Sensitivity	Precision	Accuracy	Completeness
Ammonia Nitrogen	Nessler method	mg/l	0.05	0.01	±0.2 (<2.0) ±10% (>2)	±0.2 (<2.0) ±10% (>2)	80%
Nitrate Nitrogen	Cadmium reduction	mg/l	0.05	0.01	±0.2 (<2.0) ±10% (>2)	±0.2 (<2.0) ±10% (>2)	80%
Ortho-Phosphate	Ascorbic acid	mg/l	0.07	0.01	±0.2 (<2.0) ±10% (>2)	±0.2 (<2.0) ±10% (>2)	80%

Table 7.3. Data Quality Objectives for Biological Parameters

Parameter	Method/Range	Units	Detection Limit	Sensitivity	Precision	Accuracy	Completeness
Total Coliform Bacteria	Colilert-18	MPN/ 100ml	2.2	See IDEXX quantitray tables	Duplicates within 95% confidence limits	Positive standard within ½ of an order of magnitude	80%
E. coli Bacteria	Colilert-18	MPN/ 100ml	2.2	See IDEXX quantitray tables	Duplicates within 95% confidence limits	Positive standard within ½ of an order of magnitude	80%
Entero-coccus Bacteria	Enterolert	MPN/ 100ml	2.2	See IDEXX quantitray tables	Duplicates within 95% confidence limits	Positive standard within ½ of an order of magnitude	80%

Note: Analytical methods and data quality objectives for pesticides and metals are not addressed in this QA plan. Samples for these parameters will be taken by volunteers and staff, and sent to an outside laboratory for analysis. The data quality objectives are described in Appendix F.

7.1 Accuracy

7.1.1. Chemical and Physical Parameters

Accuracy describes how close the measurement is to its true value. Accuracy is the measurement of a sample of known concentration and comparing the known value against the measured value. The accuracy of measurements and analyses will be checked by performing tests on standards and spiked samples at the quality control sessions **held twice a year**. A standard is a known concentration of a specific solution. Standards can be purchased from chemical or scientific supply companies. Standards can also be prepared by a professional partner, e.g. a commercial or research laboratory. The concentration of the standards, known to the volunteer leader, will be unknown to the monitors until after measurements are determined. The concentration of the standards should be within the mid-range of the equipment. The Data Quality Form: Accuracy, found in Appendix D, will be used to record accuracy and all QA data will be captured as per the Clean Water Team's (CWT) Data Quality Management (DQM) Guide.

7.1.2. Biological Parameters

Accuracy for bacteria will be determined by analyzing a positive control sample twice annually. A positive control is similar to a standard, except that a specific discreet value is not assigned to the bacterial concentrations in the sample. This is because bacteria are living, reproducing organisms, with variable mortality rates. Instead of a specific value, an approximate target value of the bacterial concentration is assigned to the sample by the laboratory preparing the positive control sample. Split samples will be taken amongst the different groups and with certified labs.

7.2. Comparability

Comparability is the direct correlation of collected data to similar studies. Uniformity in data collection is essential for the utility of the data in the state database. Citizen monitoring groups will use the methods described in the following resource documents to ensure that their data can be compared to others:

- Ventura County Stormwater Quality Management Plan
- Calleguas Creek Watershed Management Plan
- Santa Barbara Channelkeeper's Ventura River Stream Team
- Heal the Bay's Malibu Creek Stream Team

Before modifying these methods, or developing alternative or additional methods, technical advisors will evaluate and review the effects of the potential modification. It will be important to address their concerns about data quality before proceeding with the monitoring program. Conformity of data is an essential part of citizen monitoring programs.

7.3. Completeness

Completeness is the fraction of planned data that must be collected. There are no statistical criteria that require minimal data. However, it is expected that 80% of all measurements could be taken when anticipated. This accounts for adverse weather conditions, safety concerns, and equipment problems.

Completeness is determined by comparing the number of measurements planned on being collected compared to the number of measurements actually collected, also deemed valid. An invalid measurement would be one that does not meet the sampling methods requirements and the data quality objectives. Completeness results will be checked quarterly. This will allow for the identification and correction of problems. The Data Quality Completeness Form, found in Appendix D, will be used to record completeness. It will alsocontribute to statewide data conformity and utility.

7.4. Precision

7.4.1. Chemical and Physical Parameters

The precision objectives apply to duplicate and split samples taken as part of a QC session or as part of periodic in-field QC checks. Precision describes how well repeated measurements agree. The evaluation of precision described here relates to repeated measurements taken by either different volunteers on the same sample (at quality control sessions) or the same volunteer analyzing replicate samples (in the field). Sampling variability will not be covered in this section. The Data Quality Precision Form, found in Appendix D, will be used to record precision.

7.4.2. Biological Parameters

Precision for bacterial parameters will be determined by having the same analyst complete the procedure for laboratory duplicates of the same sample. At a minimum this should be done once per day, or run duplicates on a minimum of 5% of the samples if there are over 20 samples run per day. The results of the duplicates should be within the confidence limits supplied by the manufacturer.

7. 5. Representativeness

Representativeness will be ensured by collecting the samples and taking measurements in accordance with Section 10, 11 and 12, by following the established methods, and by obtaining approval of this document. Representativeness describes how relevant the data are to the actual environmental condition. Problems can occur if:

- Samples are taken in a stream reach that does not describe the area of interest (e.g. a headwaters sample should not be taken downstream of a point source),
- Samples are taken in an unusual habitat type (e.g. a stagnant backwater instead of in the flowing portion of the creek),
- Samples are not analyzed or processed appropriately, causing conditions in the sample to change (e.g. water chemistry measurements are not taken immediately).

7. 6. Method Detection Limit and Sensitivity

The Method Detection Limit is the lowest detectable concentration for the instrument, chemical procedure, or equipment. This is important because it can never be determined if a pollutant was not present, only that it was not detected. Sensitivity refers to the detectable differences in concentration for test instruments. Thus, the sensitivity is the number of decimal places that are useable and repeatable. Detection Limits and Sensitivities are noted in Tables 7.1. - 7.3. Detection limits will be tested and verified.

8. Training Requirements

All citizen monitoring leaders must participate in a minimum of three days of hands-on training sessions on water quality monitoring conducted by the Clean Water Team of the State Water Resources Control Board or equivalent.

In addition to completion of the above described training course, the citizen monitoring leaders must participate in **semi-annual** Quality Control Sessions. These Quality Control Sessions will be supervised by Quality Control Trainers and will provide an opportunity for citizen monitors to check the accuracy and precision of their equipment and techniques. Quality Control Trainers are defined as water quality professionals from the U.S. Environmental Protection Agency, the State Water Resources Control Board, and the Regional Water Quality Control Boards. Additional qualified trainers may be recruited and designated by the above agencies from experienced citizen monitoring organizations, universities and colleges, commercial analytical laboratories, and other federal, state, and local agencies.

The volunteer leaders will bring their equipment to the Quality Control Session. Monitors will conduct duplicate tests on all analyses and meet the data quality objectives described in Section 7. If a monitor does not meet the objectives, the trainers will re-train and re-test the monitor. If there is insufficient time at the QC session to re-train and re-test monitors, the monitor will be scheduled for an additional training sessions as required. The volunteer leader will be encouraged to discontinue monitoring for the analysis of concern until training is completed.

The Quality Control Trainers (Trainers) will examine kits for all of components: date, condition, and supply of reagents, and whether the equipment is in good repair. The Trainers will check data quality by testing equipment against blind standards. The Trainers will also ensure that monitors are reading instruments and recording results correctly. Sampling and safety techniques will also be evaluated. The Trainer will make noted recommendations to the volunteers to improve sampling or safety procedures. The citizen monitoring leader is responsible for the follow-up reports. Refresher courses after initial training will be provided as needed, or when methodology changes.

9. Documentation and Records

All field results will be recorded at the time of collection using the field data sheets (see Appendix C). Data sheets will be reviewed for outliers and omissions before volunteers leave the sample site. Data sheets will be signed after review by the citizen monitoring leader. Data sheets will be stored in hard copy form at the location as specified in Section 5.2. Field data sheets are to be archived for three years from the time they were collected. If data entry is ever performed at another location, duplicate data sheets will be used, with the originals remaining at the headquarters site. Hard copies of all data as well as computer back-up disks are maintained at headquarters, and a second copy is to be kept at a different location.

10. Sampling Process Design

10.1. Rationale for Selection of Sampling Sites

Selection of sampling sites is designed to obtain useful data to enhance existing monitoring programs. Sampling sites are selected to fill in gaps of frequency and location, which will allow us to obtain more comprehensive data on the watershed. Sampling sites vary by group. The following criteria were evaluated when choosing sampling locations:

- access is safe,
- permission to cross private or posted public property is granted,
- sample can be taken in main river current or where homogeneous mixing of water occurs,
- sample is representative of the part of the water body of interest,
- location complements or supplements historical data, and
- location represents an area that possesses unique value for fish and wildlife or recreational use.

Reference sites are chosen upstream of any potential impact. A site chosen to reflect the impact of a particular discharge, tributary or land use is located downstream of the impact where the impact is completely integrated with the water, but upstream of any secondary discharge or disturbance.

Prior to final site selection, permission to access the water body was obtained from all property owners except publicly accessible water bodies. If access to the site becomes a problem, the citizen monitoring leader will select a new site following the site selection criteria identified in Section 10.1. Safety concerns are discussed in the field guide.

Sample sites will be reviewed by the leader before sending citizen monitors out to the site. The monitoring leader will document permission and terms obtained from landowners.

10.2. Sample Design Logistics

Citizen monitors are instructed to work in teams of at least two people. If a scheduled team cannot conduct the sampling, the team captain is instructed to contact the citizen monitoring leader so that arrangements can be made for a substitute trained citizen monitor.

Safety measures will be discussed with all citizen monitors. No instream sampling will be conducted if there are small creek flood warnings or advisories, marine or small boat craft advisories, or storm advisories. It is the responsibility of the citizen monitoring organization to ensure the safety of their citizen monitor monitors. Safety issues are included in the Field Guide.

11. Sampling Method Requirements

The Field Guide describes the appropriate sampling procedure for collecting samples for water chemistry. Water sampling apparatus may include LaMotte and/or YSI Dissolved Oxygen Samplers. In those cases where glass bottles are required in Table 11.1, plastic samplers are allowed as long as the hold time in the sampling device is minimal before transfer to the glass sample bottle. Sampling devices and sample bottles (that are not pre-sterilized and do not contain preservatives/fixing agents) will be rinsed three times with sample water prior to collecting each sample. For sterile bottles, whirl-paks, and sample bottles which contain preservatives/fixing agents (e.g., acids, etc.) never rinse with sample water prior to collecting the sample. Also, never use a sample bottle containing preservatives/fixing agents for sampling; in these cases always use a sampling device to collect the sample prior to transferring the sample into the bottle.

Whenever possible, the collector will sample from a bridge so that the water body is not disturbed from wading. All samples are to be taken approximately in mid-stream, at least one inch below the surface. If it is necessary to wade into the water, the sample collector stands downstream of the sample, taking a sample upstream. If the collector disturbs sediment when wading, the collector will wait until the effect of disturbance is no longer present before taking the sample.

The following table describes the sampling equipment, sample holding container, sample preservation method and maximum holding time for each parameter.

Table 11.1 Sampling Method Requirements

Parameter	Sample Bottle	Preferred / Maximum Holding Times
Conventional Parameters		
Temperature	clear plastic bottle or sample directly	immediately
Dissolved oxygen	plastic bottle or sample directly	immediately / for wet chemistry fix per protocol instructions, continue analysis within 8 hr.
pH	plastic bottle or sample directly	immediately
conductivity	plastic bottle or sample directly	immediately / refrigerate up to 24 hours.
salinity	plastic bottle or sample directly	immediately
turbidity	plastic bottle or sample directly	immediately / store in dark for up to 24 hours.
Nutrients		
Ammonia N	plastic bottle	immediately / up to 8 hours if the sample is acidified with sulfuric acid to less than 3.0 pH.
Nitrate N	plastic bottle	immediately / refrigerate in dark for up to 48 hours.
Ortho-Phosphate	plastic bottle	immediately / refrigerate in dark for up to 8 hours .
Biological Samples		
Bacteria	sterile plastic sampling bottle or whirl-pak	Refrigerate to 4 degrees C in the dark; delivered to the lab within 4 hours, start analysis within 6 hours.
Laboratory Analysis of Chemical Parameters		
Metals	plastic or glass container	HNO3 to pH<2, send to lab immediately, max holding time 6 months.
Pesticides	glass container	Cool to 4 degrees C, pH 5-9. send to lab immediately, max holding time 7 days until extraction, 40 days after extraction.

12. Sample Handling and Custody Procedures

12.1. Sample Handling

Identification information for each sample will be recorded on the field data sheets (see Appendix C) when the sample is collected. Samples that are not processed immediately in the field will be labeled with the waterbody name, sample location, sample number, date and time of collection, sampler's name, and method of preservation.

12.2. Custody Procedures

The conventional water quality monitoring tests do not require specific custody procedures since they will, in most cases, be conducted immediately by the same person who performs the sampling. In certain circumstances (such as driving rain or extreme cold), samples will be taken to a nearby residence for analysis. Samples requiring chemical preservation will be fixed prior to transport.

When samples are transferred from one citizen monitor to another member of the same organization for analysis, or from the citizen monitoring group to an outside professional laboratory, then a Chain of Custody Form should be used (provided by the laboratory). This form identifies the waterbody name, sample location, sample number, date and time of collection, sampler's name, and method used to preserve sample (if any). It also indicates the date and time of transfer, and the name and signature of the sampler and the sample recipient. In cases where the sample remains in the custody of

the monitoring organization, then the field data sheet may be allowed to double as the chain of custody form. It is recommended that when a sample leaves the custody of the monitoring group, then the Chain of Custody Form used be the one provided by the outside professional laboratory. Similarly, when quality control checks are performed by a professional lab, their samples will be processed under their chain of custody procedures with their labels and documentation procedures.

12.3. Disposal

All analyzed samples or spent chemicals (except for waste from the nitrate/cadmium reduction test and the Nessler ammonia test) including used reagents, buffers or standards will be collected in a plastic bottle clearly marked "Waste" or "Poison". This waste material will be disposed of according to appropriate state and local laws and regulations. This will usually mean disposal into a drain connected to a sewage treatment plant.

Liquid waste from the cadmium reduction nitrate test will be kept separate and disposed of at a facility that is permitted to handle, transport, or dispose cadmium (Cd) waste. Liquid waste from the Nessler ammonia test (which contains mercury) will likewise be kept separate and disposed of at a facility that is permitted to handle, transport, or dispose mercury (Hg) waste. Waste from the salicylate ammonia test can be held in the regular waste container and disposed of as described in the previous paragraph.

13. Analytical Methods Requirements

Water chemistry is to be monitored using protocols outlined in the Field Guide. The methods were chosen based on the following criteria:

- capability of citizen monitors to use methods,
- provide data of known quality,
- ease of use,
- methods can be compared to professional methods in *Standard Methods*[1].

If modifications of methods are needed, comparability will be determined by side-by-side comparisons with a US EPA or APHA Standard Method on no less than 50 samples. If the results meet the same precision and accuracy requirements as the approved method, the new method will be accepted.

Table 13.1 outlines the methods to be used, any modifications to those methods, and the appropriate reference to a standard method.

Table 13.1 Analytical Methods for Water Quality Parameters

Parameter	Method	Modification	Reference (a)
Temperature	Thermometric	Alcohol-filled thermometer marked in 0.5^{o}C increments	2550 B.
Dissolved Oxygen	Membrane Electrode	None	4500-O G.
pH	Electrometric	None	4500-H B.
Conductivity	Electrometric	None	2520 B.
Salinity	Electrometric	None	2520 B
Turbidity	Nephelometric	None	2130 B
Transparency	Secchi disk	None	

[1] *Standard Methods for the Examination of Water and Wastewater* is a comprehensive reference that covers all aspects of water and wastewater analysis techniques. A joint publication of the American Public Health Association, the American Water Works Association, and the Water Environment Federation, the most recent *Standard Methods*, 20th Edition was published in 1998.

Ammonia N	Nessler or Phenate/Salicylate	prepackaged reagents, colorimeter or spectrophotometer	4500 – NH3 C 18th edition only (1992)
Nitrate N	Cadmium Reduction	prepackaged reagents, colorimeter or spectrophotometer	4500 – NO_3^- E.
Orthophosphate	Ascorbic acid	prepackaged reagents, colorimeter or spectrophotometer	4500 – P E.
Metals	EPA 200.8	None	
Pesticides	EPA 625	None	6410 B
Total Coliform Bacteria	Colilert-18	None	9223 B
E. coli Bacteria	Colilert-18	None	9223 B
Enterococcus Bacteria	Enterolert	None	IDEXX Corp.

(a) All of the above methods, with the exception of Enterococcus bacteria are described in Standard Methods for the Examination of Water and Wastewater 20th Edition. American Public Health Association *et al.*, 1998.

14. Quality Control Requirements

Quality control samples will be taken to ensure valid data are collected. Depending on the parameter, quality control samples will consist of blanks (field, trip and laboratory), replicate samples, and split samples. The temperature of the sample transport container will also be measured. In addition, quality control sessions (a.k.a. intercalibration exercises) will be held twice a year to verify the proper working order of equipment, refresh citizen monitors in monitoring techniques and insure data quality objectives are met.

14.1. Cautions Regarding Test Procedures

14.1.1. Nutrients

The nitrate test measures nitrite as well as nitrate. Therefore the results for the nitrate test are actually mg/l Nitrite + Nitrate Nitrogen. When mixing nitrate reagents citizen monitors should take care not to agitate samples aggressively. Phosphate reagents (the LaMotte chemical test kits) have been shown to degrade well within their listed shelf life once opened.

14.2. Blanks, Replicates, Split Samples, and Standardization

Field/Trip/Laboratory Blanks*:* In our testing, a field blank will be distilled water exposed to the sampling environment at the sample site, a trip blank will be distilled water taken from the laboratory and into the field and returned to the lab unopened, and a lab blank will be distilled water put through the entire lab procedure and analysis. For all conventional water quality analyses, except temperature, dissolved oxygen and pH, field and trip blanks will be analyzed once daily. For nutrients using comparators, a field blank will be analyzed every sampling trip. Color can sometimes appear in these nutrient blanks, suggesting that the real samples may be overestimating the true nutrient concentration. When colorimeters or spectrophotometers are used at the group's facility for nutrient analysis, a laboratory reagent blank will be analyzed and recorded for each day of analysis. For bacterial analysis performed at a group's facility, a laboratory blank will be performed for each sampling/analysis event.

Instructions for Field, Trip, and Lab Blanks: Distilled water is taken into the field or used in the laboratory and handled just like a sample. It will be poured into the sample container and then analyzed. When reagents are used in a test method,

then the reagents are added to the distilled water and these types of blanks are referred to as reagent blanks. Field blanks are recorded on the field data sheet. For nutrients measured with comparators, results from the field reagent blanks should be "not detected". If nutrients are detected, corrective action will be taken to eliminate the problem. For nutrients measured with colorimeters, the lab reagent blanks should be less than 0.05 ppm and the specific value should be recorded and subtracted from the field sample result. For bacterial analysis, the reagents are added to distilled water (in the same manner as for a field sample) and that blank is then sealed in a quantitray and incubated along with the field samples. The blank should be below detection limits (i.e., no positive wells) at the end of the incubation period.

Replicate Samples: Replicate samples are two or more samples collected at the same time and place. When there are only two replicates then these are referred to as duplicates. For conventional water quality and nutrients, duplicate field samples will be taken once every 20 samples, or quarterly whichever comes first. Duplicate samples will be collected as soon as possible after the initial sample has been collected, and will be subjected to identical handling and analysis. For bacterial analysis, lab duplicates will be run at least once per sampling day, and when there are more than 20 samples run per day then there will be a minimum 5% of the samples analyzed in duplicate.

Split Samples: Twice a year, split spiked samples (standards) will be analyzed as part of the Quality Control Session. The split standard is one sample, containing a known concentration of an analyte, that is divided equally into two or more sample containers. Split standards will be analyzed by the citizen monitors, and sent to a professional laboratory (except for dissolved oxygen, temperature, and pH), before the maximum sample handling time is exceeded. Citizen monitors will analyze the split standard normally and will perform at least three analyses on that same sample. From these results accuracy and precision will be determined. The professional laboratory will analyze the sample using the method referenced in Table 13.1

For bacteria, split field samples or split positive controls will be analyzed by the citizen monitoring group and an outside professional laboratory twice annually. In addition, at the quality control session different analysts from the citizen monitoring group(s) will each read a minimum of the three quantitrays and compare their results. These results should be within $\pm$ one well for concentrations of less than 1000 MPN/100 ml, and within $\pm$ two wells for concentrations of greater than 1000 MPN/100ml.

Standardization of Instruments and Procedures: At the Quality Assurance Sessions the temperature measurements will be standardized by comparing our thermometers to a National Institute of Standards and Technology (NIST)-certified or calibrated thermometer in ice water and ambient temperature water. All meters (pH, conductivity, oxygen) will be evaluated at the Quality Assurance Session using standards provided with the assistance of a professional laboratory and/or the technical advisors. For oxygen meters the standard will be distilled water saturated with oxygen

Table 14.1 Summarizes the Quality Control Requirements.

Table 14.1 Summary of Quality Control Requirements

Parameter	Blank	Duplicate Sample	Split Sample to lab	QC session
Water quality				
Temperature	none	5% or a minimum of once a year	none	twice a year
Dissolved oxygen	none	5% or a minimum of once a year	none	twice a year
pH	none	5% or a minimum of once a year	none	twice a year
Conductivity/Salinity	daily	5% or a minimum of once a year	twice a year	twice a year
Turbidity/Transparency	daily	5% or a minimum of once a year	twice a year	twice a year
Nutrients (comparators)				
Ammonia	daily	5% or a minimum of once a year	twice a year	twice a year
Nitrate	daily	5% or a minimum of once a year	twice a year	twice a year
Ortho-Phosphate	daily	5% or a minimum of once a year	twice a year	twice a year
Nutrients (colorimeters or spectrophotometers)				

Ammonia	daily	5% or a minimum of once a year	twice a year	twice a year
Nitrate	daily	5% or a minimum of once a year	twice a year	twice a year
Ortho-Phosphate	daily	5% or a minimum of once a year	twice a year	twice a year
Biological Parameters				
Total Coliform and *E. coli* Bacteria	daily	5% or a minimum of once per day	twice a year	twice a year
Enterococcus Bacteria	daily	5% or a minimum of once per day	twice a year	twice a year

15. Instrument/Equipment Testing, Inspection, and Maintenance

15.1. Temperature

Before each use, thermometers are to be checked for breaks in the column. If a break is observed, the alcohol thermometer will be placed in hot water causing the alcohol to expand and fill the column. Verify accuracy by comparing with a calibrated or certified thermometer.

15.2. Dissolved oxygen

Dissolved Oxygen Meters: Membranes and solutions should be replaced according to manufacturer's specifications, but at least quarterly. Membranes should be checked for bubbles after replacement. Before each use, D.O. meters are checked to see if they are clean and in good working order.

15.3. Conductivity and pH

Before each use, conductivity and pH meters are checked to see if they are clean and in good working order. Conductivity and pH meters are calibrated before each use. Conductivity standards and pH buffers are replaced at least annually. Conductivity standards are stored with the cap firmly in place and in a dry place kept away from extreme heat. Do not re-use pH or conductivity standards.

15.4. Turbidity and Transparency

Nephelometers: Meters and tubes should be checked for cleanliness and proper operation. The tubes should not be smudged or scratched.

15.5. Nutrients

Before each use, test kits are checked to ensure that droppers, sample containers, and color comparators are clean and in working condition. Colorimeter tubes should be checked to make sure they are clean and are not scratched. Reagents are replaced annually or according to manufacturer's instructions.

16. Instrument Calibration / Standardization and Frequency

Instruments will be calibrated and reagents checked against standards accordingly to the following schedule. Standards will be purchased from a chemical supply company or prepared by (or with the assistance of) a professional laboratory. Calibration records will be kept in the maintenance log at the headquarters location (described in Section 5.2.) where it can be easily accessed before and after equipment use. Calibrations that are performed by monitors in the field are recorded on the field data sheets, also archived at the headquarters. The frequency of calibration is described in Table 16.1.

Table 16.1 Instrument Calibration and Frequency

Conventional Water Quality Parameters		
Equipment Type	**Calibration Frequency**	**Standard or Calibration Instrument Used**
Temperature	Every 6 months	NIST calibrated or certified thermometer
Dissolved Oxygen meter	Every sampling day	At a minimum, water saturated air, according to manufacturer's instructions.
pH	Every sampling day	pH 7.0 buffer and one other standard (4 or 10)
conductivity	Every sampling day	Conductivity standard and distilled water
salinity	Every sampling day	Check accuracy with distilled water.
Turbidity meter (nephelometer)	Every sampling day	For clear ambient conditions use an 1.0 NTU standard, for turbid conditions use an 10.0 NTU standard

Nutrients (using colorimeters or spectrophotometers)		
Equipment type	**Checked against Standard**	**Standard Used**
Ammonia	every 6 months or when reagents replaced	ammonia standard
Nitrate	every 6 months or when reagents replaced	nitrate standard
Ortho-Phosphate	every 6 months or when reagents replaced	ortho-phosphate standard

17. Inspection/Acceptance Requirements

Upon receipt, buffer solutions, standards, and reagents used in the field kits will be inspected by the citizen monitoring leader for leaks or broken seals, and to compare the age of each reagent to the manufacturer's recommended shelf-life. All other sampling equipment will be inspected for broken or missing parts, and will be tested to ensure proper operation.

Before usage, thermometers are inspected for breaks in the alcohol column. Breaks can be eliminated by heating (see Section 15.1). If not, they will be returned to the manufacturer.

Reagents are replaced before they exceed manufacturer's recommended shelf life. These shelf lives are typically one to two years. However, specific replacement dates can determined by providing the reagent lot number to the manufacturer. Reagent replacement dates are noted in the maintenance log.

18. Data Acquisition Requirements

18.1. Professional Analytical Data

Only certified analytical laboratories or academic laboratories (with approval of State and/or LARWQCB staff) will be used for quality assurance checks and analysis of field samples using SWAMP QA/QC at a minimum. The Technical advisory Committee (TAC) or technical advisors will review these laboratories' data as well as the citizen monitors. They may also review the lab's own quality control data to ensure data validity.

18.2. Geographical Information/ Mapping

United States Geologic Survey (USGS) maps will be used to verify watershed boundaries and river courses. National Oceanographic and Atmospheric Administration (NOAA) navigation charts can be used for mapping marine sampling sites. Additional information on distribution of natural resources will be obtained from the National Park Service (NPS) and the California Department of Fish and Game (CDFG) Biodiversity database. Land use information will be obtained from local planning offices. When information is requested, the agency will be asked to provide appropriate megadata and any information on data limitations. This information will be maintained with the data files.

19. Data Management

Field data sheets are checked and signed in the field by the citizen monitoring leader. The citizen monitoring leader will identify any results where holding times have been exceeded, sample identification information is incorrect, samples were inappropriately handled, or calibration information is missing or inadequate. Such data will be marked as unacceptable by the monitoring leader and will not be entered into the electronic data base.

As part of standard field protocols, any sample readings out of the expected range will be reported to the citizen monitoring leader. A second sample will be taken as soon as possible to verify the condition. If the data is invalid, then the data will be noted (flagged) on the data sheet. We will take further actions to trace the sources of error, and to correct those problems. If the error is a result of improper monitoring procedures, then we may re-train monitors until their performance is acceptable. It is the responsibility of the citizen monitoring leader to re-train citizen monitors until performance is acceptable.

Independent laboratories will report their results to the citizen monitoring leader. The leader will verify sample identification information, review the chain-of-custody forms, and identify the data appropriately in the database. These data are also reviewed by the technical advisors quarterly.

The data management coordinator will review the field sheets and enter the data deemed acceptable by the citizen monitoring leader and the technical advisors. Range checks and other QA/QC methods will be performed before accepting the data set and data analysis. Upon entering the data the data management coordinator will sign and archive the field data sheets. Data will be entered into a spreadsheet (MS Excel) or a database (MS Access) in a way that will be compatible with EPA's STORET[2] and the Regional WQCB's database guidelines. Following initial data entry the data coordinator will review electronic data, compare to the original data sheets and correct entry errors. After performing data checks, and ensuring that data quality objectives have been met, data analysis will be performed.

Raw data will be provided to the State WQCB and Regional WQCB in electronic form at least once every two years so that it can be included in the 305(b) report. Appropriate quality assurance information may be provided on request.

20. Assessment and Response Actions

Review of all field and data activities is the responsibility of the citizen monitoring leader, with the assistance of the technical advisory committee. Citizen monitors will be accompanied by the citizen monitoring leader, or a technical advisor on at least one of their first 5 sampling trips. If possible, citizen monitors in need of performance improvement will be retrained on-site. All citizen monitors must attend a refresher course offered by the citizen monitoring group. If errors in sampling technique are consistently identified, retraining may be scheduled more frequently.

21. Reports

Raw data screened by the Quality Assurance (QA) officer will be made available to data users per request. The citizen monitoring organization(s) will report their data to its (their) constituents only after QA/QC standards have been reviewed and approved by their technical advisors. Every effort will be made to submit data and/or a report to the State and/or LARWQCB staff in a fashion timely for their data uses, e.g. 305(b) reports.

22. Validation and Verification Methods

As part of standard field protocols, any sample readings out of the expected range will be reported to the citizen monitoring leader. A second sample will be taken as soon as possible to verify the condition. If the data is invalid, then the data will be noted (flagged) on the data sheet. We will take further actions to trace the sources of error, and to correct

[2] EPA's STORET (short for STOrage and RETrieval) is a repository for water quality, biological, and physical data and is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others.

those problems. If the error is a result of improper monitoring procedures, then we may re-train monitors until their performance is acceptable. It is the responsibility of the citizen monitoring leader to re-train citizen monitors until performance is acceptable.

23. Data Review, Validation, and Verification

Data sheets or data files are reviewed twice a year by the technical advisors to determine if the data meet the Quality Assurance Project Plan objectives. They will identify outliers, spurious results or omissions to the citizen monitoring leader. They will also evaluate compliance with the data quality objectives. They will suggest corrective action that will be implemented by the citizen monitoring leader. Problems with data quality and corrective action will be reported in final reports.

24. Reconciliation with Data Quality Objectives

The Technical Advisory Committee working with the Volunteer Leader will review data at least twice a year to determine if the data quality objectives (DQOs) have been met. They will suggest corrective action. If data do not meet the project's specifications, the following actions will be taken. First, the technical advisors will review the errors and determine if the problem is equipment failure, calibration/maintenance techniques, or monitoring/sampling techniques. If the problem cannot be corrected by training, revision of techniques, or replacement of supplies/equipment, then the technical advisors and the TAC will review the DQOs and determine if the DQOs are feasible. If the specific DQOs are not achievable, they will determine whether the specific DQO can be relaxed, or if the parameter should be eliminated from the monitoring program. Any revisions to DQOs will be appended to this QA plan with the revision date and the reason for modification. The appended QA plan will be sent to the quality assurance panel that approved this plan. When the appended QA plan is approved, the citizen monitoring leader will work with the data coordinator to ensure that all data meeting the new DQOs are entered into the database. Archived data can also be entered.

APPENDICES

Appendix A – Description of the Wishtoyo Foundation

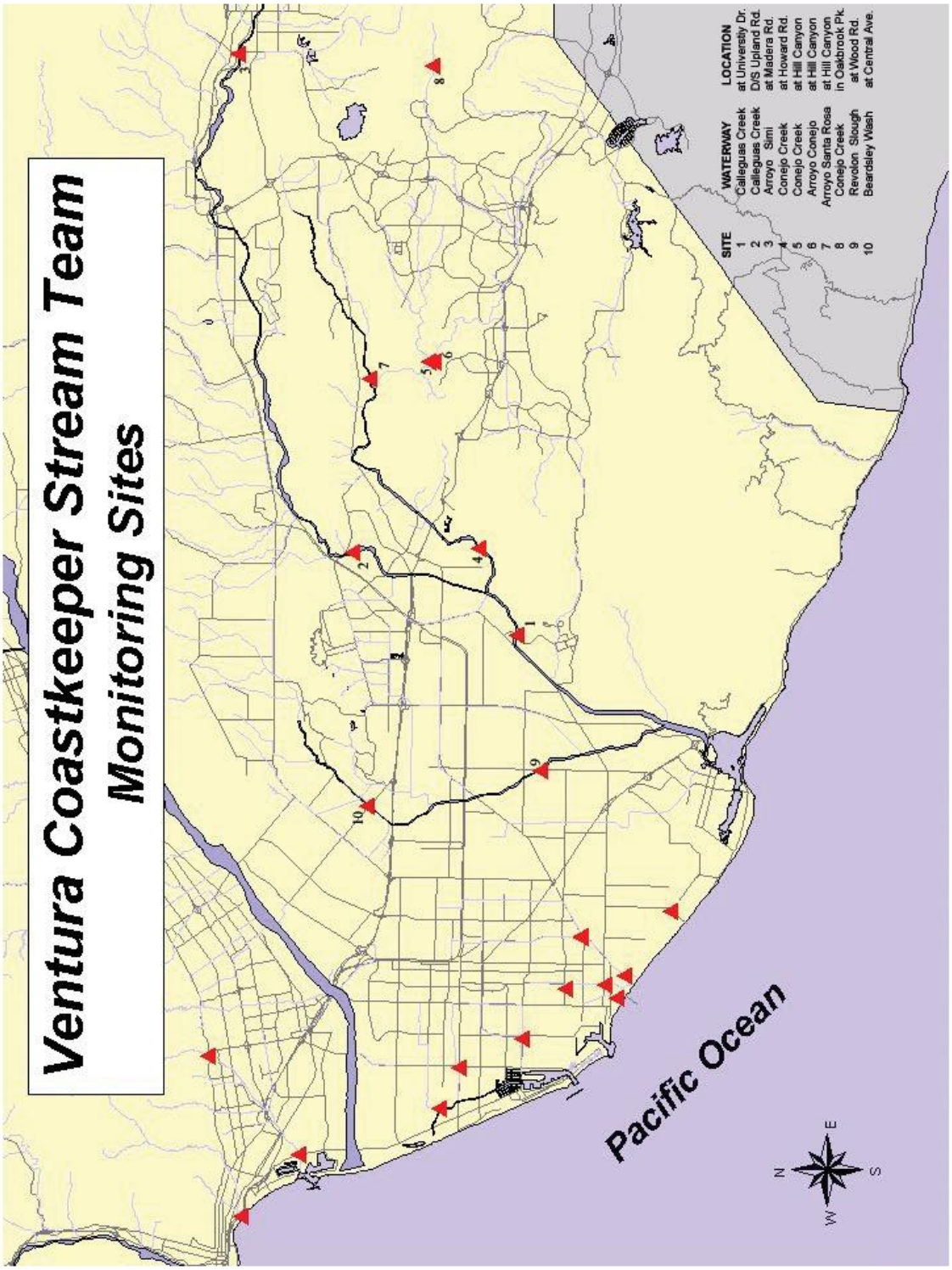
The Wishtoyo Foundation is a 501(c)(3) nonprofit, community-based Native American organization that uses traditional Chumash cultural values to foster environmental awareness. Our members include both Chumash natives and local community residents. These members, together with local residents, will be heavily involved in the restoration work described in this proposal.

A project of the Wishtoyo Foundation is Ventura Coastkeeper. Ventura Coastkeeper Stream Team is comprised of trained citizen volunteers who conduct water quality sampling. Ventura Coastkeeper is establishing a large-scale water quality monitoring program for the Calleguas Creek Watershed with the cooperation of the Ventura County Watershed Protection District and the United States Navy. Additionally, the Wishtoyo Foundation/Ventura Coastkeeper is working in cooperation with the Ventura County Watershed Protection District in their Ventura County Stormwater Program goals which include characterization and identification of water pollution while providing community opportunities for environmental public education and outreach. Wishtoyo believes that stewardship will lead to greater awareness of pollution problems and eventual reduction of pollutant loads to the watershed, and greater protection of the Calleguas Creek Watershed's beneficial uses.

Technical Advisors
Darla Wise, Stormwater Engineer, Ventura County Watershed Protection District
Allen Leydecker, Researcher, University of California at Santa Barbara
Mark Abramson, Stream Team Manager, Heal the Bay

Group Leader
Leigh Ann Grabowsky, Program Director, Wishtoyo Foundation/Ventura Coastkeeper

Appendix B – Map of Volunteer Sampling Stations



Appendix C – Field Data Sheet

Stream Team Water Chemistry Testing

Chemical Parameters Field Sheet

Date:_____ **Site Number:**_____ **Site Name:**_____
Time:_____ **Team #** _____ **Name of Recorder:**_____

List all Team members:

***** For all parameters Take THREE readings in different (but similar) stretches of stream*****

Dissolved Oxygen calibrate to Site Elevation:_____ Comments:_____

reading	Mg/L	% Saturation	Water Temp	Time	Name of Sampler
1					
2					
3					

pH: take 3 measurements, please from stream☐ or sample bottle☐

1._____ **2.**_____ **3.**_____ Sampler Name:_____

TURBIDITY (TSS): *make sure bottle is clean and aligned properly!
Fill two Sample Vials, take three readings each. Units are in NTU

Vial#1 1._____ 2._____ 3._____ Sampler:_____
Vial#2 1._____ 2._____ 3._____ Sampler:_____

CONDUCTIVITY and TDS: These are two different parameters, with the same instrument.
** press the MODE button once to get TDS readings (ppm or ppt), and twice to get back to CONDUCTIVITY
* if screen reads 9.99 or 99.9, etc., the instrument may not be auto-adjusting the range. Try pressing "range"

Readings taken from stream ☐ *or* from sample bottle ☐ Sampler Name_____

Conductivity (Circle) **uS** or **mS**	**Water temp C / F**	**Time am / pm**	**TDS** (circle) **ppm** or **ppt**
1._____	_____	_____	_____
2._____	_____	_____	_____
3._____	_____	_____	_____

SALINITY:

1._____ 2._____ 3._____ Sampler Name:_____

Appendix D – Accuracy, Precision, and Completeness Forms

Data Quality Form: Accuracy — Quality Control Session

Ventura River Watershed Monitoring Program Team #_____	Type of Session (field or lab)
Your Name	Quality Assurance Leader
Date	

Parameter/ units	Sensitivity	Accuracy Objective	Standard Conc.	Analytical Result	Estimated Bias	Meet Objective? Yes or No	Corrective action planned	Date Corrective Action taken
Temperature °C								
Dissolved Oxygen (mg/l)								
pH standard units								
Conductivity (µmhos/cm)								

Comments:

Data Quality Form: Completeness — Quality Control Session

Ventura River Watershed Monitoring Program Team #_____			Type of Session (field or lab)	
Your Name			Quality Assurance Leader	
Date				
Parameter	**Collection Period**	**No. of Samples Anticipated**	**No. Valid Samples Collected and Analyzed**	**Percent Complete**
Temperature °C				
Dissolved Oxygen (mg/l)				
pH standard units				
Conductivity (µmhos/cm)				

Comments:

Data Quality Form: Precision — Quality Control Session

Ventura River Watershed Monitoring Program Team #_____	Type of Session (field or lab)
Your Name	Quality Assurance Leader
Date	

Parameter/ units	Mean (x)	Standard Deviation (s.d.)	s.d./x	Precision Objective	Meet Objective? Yes or No	Corrective action planned	Date Corrective Action taken
Temperature °C							
Dissolved Oxygen mg/l							
pH standard units							
Conductivity (µmhos/cm)							

Comments:

Appendix E – Water Quality Monitoring Laboratory Analysis

WATER ANALYSIS	METHOD	HOLDING TIME	*CRG* MDL	BOTTLE	
Total Trace Metals					
Riverine & Stormwater	EPA 200.8	6 Months	µg/L (PPB)	500 mL in Plastic Only	
Aluminum (Al)			1		
Antimony (Sb)			0.1		
Arsenic (As)			0.1		
Barium (Ba)			0.1		
Beryllium (Be)			0.1		
Bismuth (Bi)			5		
Boron (B)			1		
Bromine (Br)			0.5		
Cadmium (Cd)			0.1		
Calcium (Ca)			0.1		
Cesium (Cs)			0.1		
Chromium (Cr)			0.1		
Cobalt (Co)			0.1		
Copper (Cu)			0.1		
Iodine (I)			0.1		
Iron (Fe)			1		
Lead (Pb)			0.1		
Lithium (Li)			0.1		
Magnesium (Mg)			1		
Manganese (Mn)			0.1		
Mercury (Hg)			0.05		
Molybdenum (Mo)			0.1		
Nickel (Ni)			0.1		
Potassium (K)			5		
Selenium (Se)			0.1		
Silicon (Si)			1		
Silver (Ag)			0.1		
Sodium (Na)			5		
Strontium (Sr)			0.5		
Thallium (Tl)			0.1		
Tin (Sn)			0.1		
Titanium (Ti)			0.1		
Vanadium (V)			0.1		
Zinc (Zn)			0.1		
FePd "Extractable" Suite inc.Al, Ag, As, Be, Co, Cr, Mn, Ni, Pb, Tl, Ti, V, Zn*					
APDC "Extractable" Suite inc. Cd*, Cu, Pd, Fe, Hg, Sb, Se, Mo, Sn					
*Zn only extractable by FePd, Cd only extractable by APDC. However, many commonly "looked at" elements can be done using either technique.					

Trace Organic Compounds			ng/L (PPTR)		
Organochlorine Pesticides and PCBs	EPA 625	7 Days for Extraction/40 Days for Analysis	ng/L (PPTR)	1 L in Amber Glass	
2,4'-DDD			1		
2,4'-DDE			1		
2,4'-DDT			1		
4,4'-DDD			1		
4,4'-DDE			1		
4,4'-DDT			1		
Aldrin			1		
BHC-alpha			1		
BHC-beta			1		
BHC-delta			1		
BHC-gamma			1		
Chlordane-alpha			1		
Chlordane-gamma			1		
Dieldrin			1		
Endosulfan Sulfate			1		
Endosulfan-I			1		
Endosulfan-II			1		
Endrin			1		
Endrin Aldehyde			1		
Endrin Ketone			1		
Heptachlor			1		
Heptachlor Epoxide			1		
Hexachlorobenzene			1		
Methoxychlor			1		
Mirex			1		
Toxaphene			10		
trans-Nonachlor			1		
PCB Aroclors (7)			10		
PCB Congeners (50)			1		
Pyrethroid Pesticides	EPA 625	7 Days for Extraction/40 Days for Analysis	ng/L (PPTR)	Same 1 L in Amber Glass	
Allethrin			1 µg/L		
Bifenthrin			5 ng/L		
Cyfluthrin			1 µg/L		
Cypermethrin			1 µg/L		
Danitol			1 µg/L		
Deltamethrin			1 µg/L		
L-Cyhalothrin			1 µg/L		
Permethrin			5 ng/L		
Prallethrin			1 µg/L		

Organophosphorous Pesticides	EPA 625	7 Days for Extraction/40 Days for Analysis	ng/L (PPTR)	Same 1 L in Amber Glass	
Bolstar (Sulprofos)			5		
Chlorpyrifos			5		
Demeton			5		
Diazinon			5		
Dichlorvos			5		
Dimethoate			5		
Disulfoton			5		
Ethoprop (Ethoprofos)			5		
Fenchlorophos (Ronnel)			5		
Fensulfothion			5		
Fenthion			5		
Malathion			5		
Merphos			5		
Methyl Parathion			5		
Mevinphos (Phosdrin)			5		
Phorate			5		
Tetrachlorvinphos (Stirofos)			5		
Tokuthion			5		
Trichloronate			5		

Appendix F – CRG Marine Laboratories SOP (attached as hard copy)

Appendix G – CRG Marine Laboratories QAPP (attached as hard copy)