SURFACE WATER AMBIENT MONITORING PROGRAM (SWAMP)

FY 2004-05 WORKPLAN

DRAFT*

California Regional Water Quality Control Board,
San Diego Region

September, 04

**** some budget allocations still to be finalized***

TABLE OF CONTENTS

Attachment A, C and E are contained in the file "04_05 Attchmnts A, C, E.xls"

1.0 INTRODUCTION

Monitoring and assessment of water quality and beneficial uses is essential in order to measure the success of the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) in achieving their mission. Ultimately, the only meaningful measure of the success of the SWRCB and of the RWQCBs is the condition of water quality and beneficial uses. This can be determined only by monitoring and assessment - not by the long-standing practice of counting program activities, i.e., "beans."

More importantly, monitoring and assessment is essential in order for the RWQCBs and the SWRCB to be successful in achieving their mission. Monitoring and assessment of ambient water quality and beneficial uses is necessary in order to:

(a) Identify and characterize water quality and beneficial use problems and threats;
(b) Identify trends in water quality and beneficial uses;
(c) Determine whether water quality standards are met;
(d) Evaluate the uniqueness or pervasiveness of problems;
(e) Evaluate the severity of problems;
(f) Make decisions about which problems and which locations should be prioritized for action; and
(g) Make decisions about what actions should be taken.

The absence of information is not the same as the absence of a problem. Likewise, the availability of more information about a problem in a particular location does not necessarily mean that particular problem is more severe than a problem at another location about which less information is available.

In accordance with Clean Water Act section 305(b), the SWRCB and RWQCBs periodically compile an inventory of the state's major waters and the water quality condition of those waters, using monitoring data and other pertinent information. This inventory is known as the Water Quality Assessment. Waters are categorized as good, intermediate, impaired, or of unknown quality. Impaired waters are categorized in accordance with requirements of various Clean Water Act sections [e.g. 131.11, 303(d), 304(m), 304(s), 304(l), 314, and 319].

The Water Quality Assessment is the foundation upon which the TMDL Program is built. Although considerable funding has been devoted to the TMDL program recently, the Water Quality Assessment Program has long been and continues to be inadequately funded. Clearly, this makes no sense. It is impossible to make sound decisions about whether and where TMDLs are needed, about which TMDLs should be done, and about when TMDLs should be done, without adequate monitoring and assessment.

There is a great need for more extensive and more thorough monitoring and assessment of the waters of the San Diego region. Monitoring and assessment, for both status and trends, needs to be planned, ongoing, and continuous. Despite its importance, ambient monitoring and assessment do not receive the attention they should and tend to fall through the cracks. This must change. Obtaining adequate funding to conduct a robust Water Quality Assessment Program is now one of the top priorities of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB). The SDRWQCB is also evaluating how to assign and structure ambient monitoring and assessment work so as to make the most of available resources. The SWRCB and RWQCBs have received resources to continue the Surface Water Ambient Monitoring Program (SWAMP). Although SWAMP resources (particularly for staff) are not nearly adequate to do what needs to be done, the funding that has been provided is a significant step in the right direction. SDRWQCB intends to use SWAMP resources so as to ensure that monitoring is conducted in each hydrologic unit once in every five-year period. Although all hydrologic units will be monitored, current funding will enable only cursory monitoring and assessment to be done. Particularly since funding is so limited, selecting

locations to be monitored, performing site reconnaissance, and deciding what to monitor is an important task for staff. Initially, staff intends to prioritize monitoring that is indicative of effects (e.g., toxicity testing, bioassessment, and benthic community analyses) rather than monitoring that simply indicates the presence and amount of a particular pollutant or class of pollutants.

Ambient monitoring is not and does not need to be conducted only by SWRCB / RWQCB staff. Academic and other research groups, dischargers, and other stakeholders all have a role in monitoring and assessment. Although there is certainly a need for more extensive and more thorough monitoring of the region's waters, better coordination of monitoring efforts and better management of information is also needed in order to increase the value, usefulness, accessibility, and use of information obtained from past, ongoing, and future monitoring efforts.

Coordination of monitoring efforts is needed to ensure that appropriate and useful information is acquired, to enable sharing of such information, and to avoid both information gaps and duplicative monitoring. Since monitoring is conducted by various agencies and as part of various programs, communication and cooperation between agencies and programs is necessary in order to coordinate monitoring efforts. A monitoring coordination program will be initiated in July 2005 to identify and evaluate regulatory and non-regulatory monitoring efforts (many of these have already been identified in Attachment A and in Tables 14 and 15) in the San Diego Region and to coordinate the SWAMP monitoring efforts with these programs.

The more accessible information is, the more useful it is, and the more likely it is to be used. Since monitoring information (and other information pertinent to water quality and beneficial uses) is location specific, a geographic information system (GIS) would be an extremely useful tool for managing and retrieving monitoring information and other information pertinent to water quality and beneficial uses. SDRWQCB will pursue development and implementation of a statewide GIS for managing and retrieving such information, as well as the funding to make use of it.

It must be noted that only a small percentage of the surface water bodies in the San Diego Region are currently monitored under SWAMP. Coastal waters, lakes and reservoirs are not monitored at all. Significantly more resources are needed if the regions waters are to be adequately monitored to assess the state of beneficial uses. Only with increased staff and contract resources can the regions water bodies be properly assessed as required by the Clean Water Act.

2.0 MONITORING SITES

There are eleven hydrologic units in the San Diego region. The SDRWQCB plans to focus SWAMP monitoring efforts on two hydrologic units in each of four fiscal years and three hydrologic units in a fifth fiscal year. This approach will ensure that SWAMP monitoring is conducted in each hydrologic unit in the region over a five-year period. Fiscal year 04-05 is the fifth year of the first 5-year cycle. The planned schedule for rotation of SWAMP monitoring among San Diego Region hydrologic units is summarized in Table 1. Depending on the results of monitoring in any given year, it may be appropriate to conduct follow-up monitoring before completion of the five-year cycle. If/when sufficient funding becomes available, the schedule may be revised to shorten the rotation cycle (e.g., to a 3-year period.)

Given the anticipated FY 2004-05 SWAMP funding allocation for the San Diego region (~$178,000), a probability-based, regional approach for selecting monitoring sites does not appear to be feasible. Consequently, for FY 2004-05, SDRWQCB plans a targeted, site-specific approach with "pre-selected" monitoring sites in the Pueblo San Diego, Sweetwater and Tijuana Hydrologic Units. If/when sufficient funding is available in the future, a probability-based, regional approach may be used to select some or all-monitoring sites

Table 1 – San Diego Region Planned SWAMP Monitoring Rotation.

HU #	Hydrologic Unit Name	Year 1	Year 2	Year 3	Year 4	Year 5
901	San Juan	X	9 sites	X	X	X
902	Santa Margarita	X	X	5 sites	X	X
903	San Luis Rey	X	X	X	6 sites	X
904	Carlsbad	9 sites	X	X	X	X
905	San Dieguito	X	X	5 sites	X	X
906	Penasquitos	6 sites	X	X	X	X
907	San Diego	X	X	X	9 sites	X
908	Pueblo San Diego	X	X	X	X	1 site
909	Sweetwater	X	X	X	X	3 sites
910	Otay	X	2 sites	X	X	X
911	Tijuana	X	X	X	X	3 sites
	Totals =	15	11	10	15	7

Number of sites represents actual sites sampled in years 1-4 and the number of sites expected to be sampled in year 5.
X = not sampled that year.

Planned SWAMP monitoring sites in all San Diego region hydrologic units are identified in Attachment B. Locations of monitoring sites are subject to revision. The exact locations of monitoring sites will be selected to enable information to be obtained on each of the selected indicators and will be finalized on the Task Orders. The number of sites, the frequency of sampling, and/or the suite of analyses to be conducted may increase or decrease, depending on the availability of SWAMP funding. Due to decreasingly predictable flows in many streams, alternate sites have been identified and will be prioritized in order to ensure a full complement of samples is collected throughout the watershed in any given year. The alternate sites were selected using the same criteria discussed above. Prior to sampling, a detailed reconnaissance will be performed at each selected site. The reconnaissance will include identification of access issues, a habitat assessment, photo-documentation, and mapping of the site. For sites in the Carlsbad and Los Penasquitos Hydrologic Units, the reconnaissance was completed in December 2001. For sites in the San Juan Creek Hydrologic Unit and Otay Hydrologic Units, the reconnaissance was completed in August 2002. Reconnaissance for sites in the Santa Margarita and San Dieguito Hydrologic Units were completed in January 2003. For sites in the San Luis Rey and San Diego Hydrologic Units reconnaissance was completed in April 2003. Reconnaissance for sites in the Pueblo San Diego, Sweetwater and Tijuana Hydrologic Units will be completed in the fall of 2004. Attachments B and C have been updated to include available reconnaissance information.

2.1 Watershed Characteristics

Descriptions, figures, and tables characterizing the watersheds were taken from the County of San Diego's Project Clean Water web site.

2.1.1 Pueblo San Diego

The Pueblo San Diego watershed is the smallest hydrologic unit (HU) in San Diego County, encompassing approximately 60 square miles of predominantly urban landscape in the cities of San Diego, La Mesa, Lemon Grove, and National City (Figure 1). The population of the Pueblo San Diego watershed is approximately 500,000 residents, making it the county's most densely populated watershed. Approximately 75 percent of the watershed is developed. Residential, retail/ office, and

industrial land uses account for 45, 11, and 10 percent of the total, respectively. In addition, there are relatively large percentages of land used for transportation corridors and highways. Due to the high level of existing urbanization in the watershed, only small amounts of additional land is projected for development over the next 15 years.

The watershed drainage consists of a group of relatively small local creeks and pipe conveyances, many of which are concrete-lined and drain directly into San Diego Bay. The creeks in the watershed are highly impacted by urban runoff, and Chollas Creek and the mouth of the creek in San Diego Bay are listed as 303(d)-impaired water bodies for various trace metals parameters, aquatic toxicity and bacteria indicators. Five sites in San Diego Bay that are impacted by runoff from the Pueblo San Diego watershed have been identified as hot spots by California's Bay Protection Toxic Cleanup Program (see Table 2 for a summary of facts about the Sweetwater Watershed).

The beneficial uses of the inland surface waters in the Pueblo San Diego watershed are limited to contact (potential use) and non-contact recreation, warm freshwater habitat, and wildlife habitat. The San Diego Bay receiving water supports an extensive array of beneficial uses (see Table 3 below).

Figure 1: Pueblo San Diego Watershed

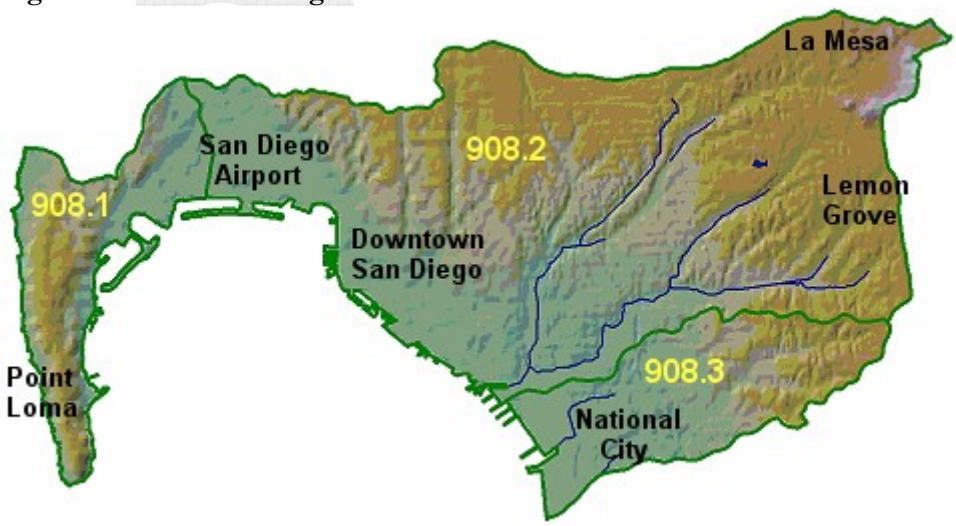

Table 2: Summary of Pueblo San Diego Facts

Hydrologic Areas:	Point Loma 908.1 San Diego Mesa 908.2 National City 908.3
Major Water Bodies:	Chollas Creek, Paleta Creek, and San Diego Bay
CWA 303(d) List:	Chollas Creek: copper, lead, zinc, cadmium, coliform bacteria, storm water toxicity San Diego Bay: coliform bacteria, benthic community effects, copper, sediment toxicity (discharges from several source basins contribute to impairments)
Major Impacts:	Surface water quality degradation, habitat degradation, sediment toxicity in San Diego Bay, and sewer overflows
Constituents of Concern:	Trace metals and other toxic substances, and coliform bacteria

Sources / Activities:	Urban runoff

Table 3: The Beneficial Uses of the Pueblo San Diego Watershed

Beneficial Uses	Inland Surface Water	Coastal Waters	Reservoirs and Lakes	Ground Water
Municipal and Domestic Supply				**x**
Industrial Service Supply		**x**		
Navigation		**x**		
Contact Water Recreation	**x**	**x**		
Non-Contact Water Recreation	**x**	**x**		
Warm Freshwater Habitat	**x**			
Estuarine Habitat		**x**		
Wildlife Habitat	**x**	**x**		
Commercial and Sport Fishing		**x**		
Biological Habitats of Special Significance		**x**		
Rare, Threatened, or Endangered		**x**		
Marine Habitat		**x**		
Migration of Aquatic Organisms		**x**		
Shellfish Harvesting		**x**		

2.1.2 Sweetwater

The Sweetwater River watershed (Figure 2) along with the Otay and Pueblo San Diego watersheds combine to form the San Diego Bay watershed area. The Sweetwater River watershed is the largest of the three, encompassing 230 of the approximately 415 square mile total. Over 86% of the watershed is within unincorporated jurisdictions. The dominant land uses in the Sweetwater River watershed are urban (29%), open space/ agriculture (22%), and undeveloped (49%). Approximately two-thirds of the land area categorized as urban is composed of residential communities. Approximately 300,000 people currently reside within the Sweetwater River watershed, and this amount is projected to increase to 365,000 by 2015. The most important watershed issues are related to the protection of municipal water supplies, and the protection and restoration of sensitive wetland and wildlife habitats.

Between the headwaters and the outlet to San Diego Bay, the watershed contains a variety of habitat types including oak and pine woodlands, riparian forest, chaparral, coastal sage scrub, and coastal salt marsh. The upper watershed contains large undeveloped areas within the Cleveland National Forest and Cuyamaca Rancho State Park, the unincorporated communities of Pine Valley, Descanso, and Alpine, and the Viejas Indian Reservation. Unincorporated rural and suburban communities characterize the central part of the watershed. The urbanized lower portion of the Sweetwater watershed contains portions of several cities including San Diego, National City, Chula Vista, La Mesa, and Lemon Grove (see Table 4 for a summary of facts about the Sweetwater Watershed). The numerous beneficial uses within the watershed are listed in Table 5 below.

Figure 2: Sweetwater Watershed

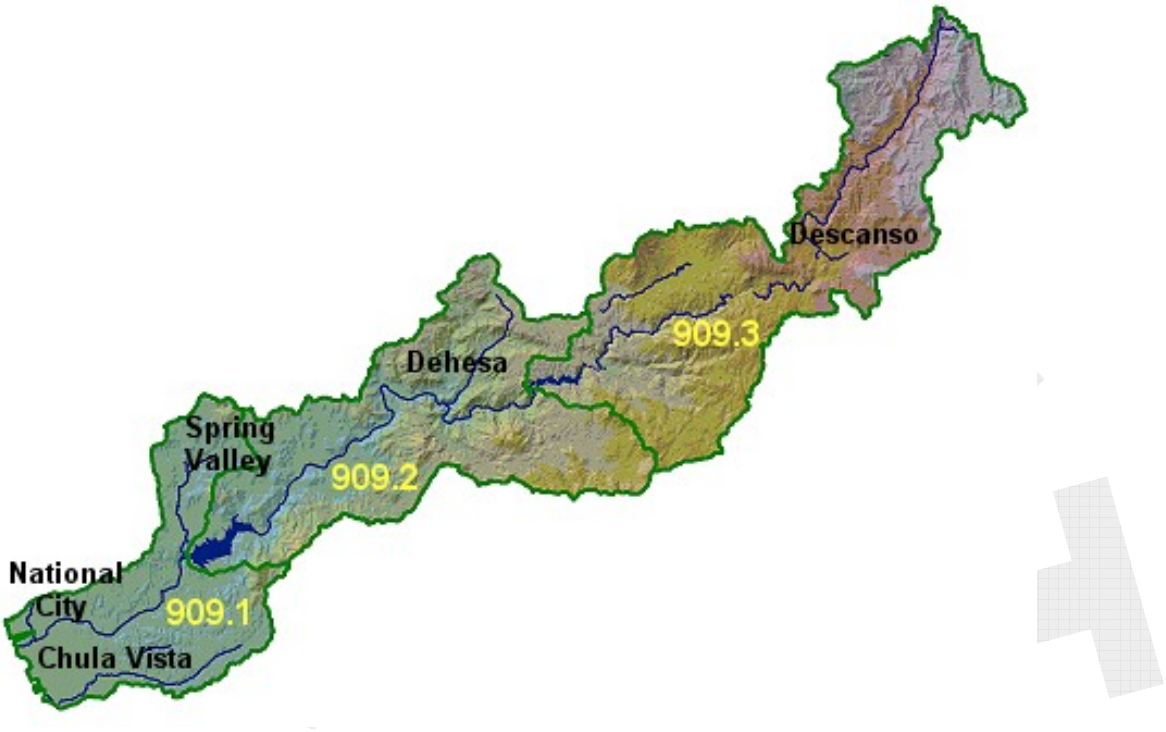

Table 4: The Beneficial Uses of the Sweetwater Watershed

Hydrologic Areas:	Lower Sweetwater 909.1 Middle Sweetwater 909.2 Upper Sweetwater 909.3
Major Water Bodies:	Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay
CWA 303(d) List:	San Diego Bay/ Telegraph: coliform bacteria
Major Impacts:	Surface and groundwater quality degradation, habitat degradation and loss, and invasive species
Constituents of Concern:	Coliform bacteria, trace metals and other toxics
Sources / Activities:	Agricultural and urban runoff

Table 5: The Beneficial Uses of the Sweetwater Watershed

Beneficial Uses	Inland Surface Water	Coastal Waters	Reservoirs and Lakes	Ground Water
Municipal and Domestic Supply	x		x	x
Agricultural Supply	x		x	x
Industrial Service Supply	x	x	x	x
Industrial Process Supply	x		x	
Navigation		x		
Contact Water Recreation	x	x	x	
Non-Contact Water Recreation	x	x	x	
Commercial and Sport Fishing		x		
Biological Habitats of Special Significance	x	x		
Warm Freshwater Habitat	x		x	
Cold Freshwater Habitat	x		x	
Wildlife Habitat	x	x	x	
Rare, Threatened, or Endangered	x	x		
Marine Habitat		x		
Migration of Aquatic Organisms		x		
Estuarine Habitat		x		
Shellfish Harvesting		x		

2.1.3 Tijuana

The Tijuana River watershed (Figure 3) encompasses a region of approximately 1,750 square miles on either side of the California – Baja California border, and in terms of water quality degradation is probably the most severely impacted watershed in San Diego County. Although only 27% of the watershed area is within California, the river discharges to the Tijuana Estuary and Pacific Ocean on the U.S. side of the international border. On the U.S. side of the border, the cities of Imperial Beach and San Diego, and San Diego County have portions of their jurisdictions within the watershed. The cities of Tijuana and Tecate are the most important urban centers on the Mexican side. The current population of the entire watershed is approximately one million people (see Table 6 for a summary of facts about the Tijuana Watershed and Table 7 for a list of the Beneficial Uses).

.

Figure 3: Tijuana Watershed

Table 6: The Beneficial Uses of the Tijuana Watershed

Hydrologic Areas:	Tijuana Valley Potrero Barrett Lake Monument Morena Cottonwood Cameron Campo	911.1 911.2 911.3 911.4 911.5 911.6 911.7 911.8
Major Water Bodies:	Tijuana River, Cottonwood Creek, and Tijuana Estuary	
CWA 303(d) List:	Tijuana River: eutrophic, coliform bacteria, organic enrichment/ low dissolved oxygen, pesticides, solids, synthetic organics, trace elements, and trash Tijuana River Estuary: eutrophic, coliform bacteria, lead, nickel, pesticides, thallium, trash Pacific Ocean at the Tijuana River mouth: coliform bacteria	
Major Impacts:	Surface water quality degradation, trash, sedimentation, eutrophication, habitat degradation and loss, flooding, erosion, and invasive species	
Constituents of Concern:	Freshwater: coliform bacteria, nutrients, trace metals, pesticides, miscellaneous toxics, low dissolved oxygen, and trash Groundwater: TDS, nitrates, petroleum, MTBE, and solvents	
Sources / Activities:	Urban runoff, sewage spills, industrial discharges, agricultural / orchards, livestock / domestic animals, and septic systems	

The Tijuana River watershed is classified as a Category I (impaired) watershed by the SWRCBdue to a wide variety of water quality problems. These problems are largely a result of non-point agricultural sources on the U.S. side of the border and a large variety of point and non-point sources on the Mexican side. The Tijuana Estuary, a National Estuarine Sanctuary that supports a variety of threatened and endangered plants and animals, is threatened by inflows from the Tijuana River containing high concentrations of coliform bacteria, sediment, trace metals (copper, lead, zinc, chromium, nickel, and cadmium), PCBs, and other urban, agricultural, and industrial pollutants.

Table 7: The Beneficial Uses of the Tijuana Watershed

BENEFICIAL USES	Inland Surface Water	Coastal Waters	Reservoirs and Lakes	Ground Water
Municipal and Domestic Supply	x		x	x
Agricultural Supply	x		x	x
Industrial Service Supply	x	x	x	x
Industrial Process Supply	x		x	
Navigation		x		
Commercial and Sport Fishing		x		
Freshwater Replenishment	x		x	
Contact Water Recreation	x	x	x	
Non-Contact Water Recreation	x	x	x	
Biological Habitats of Special Significance		x		
Warm Freshwater Habitat	x		x	
Cold Freshwater Habitat	x		x	
Estuarine Habitat		x		
Wildlife Habitat	x	x	x	
Rare, Threatened, or Endangered	x	x	x	
Marine Habitat		x		
Migration of Aquatic Organisms		x		
Aquaculture		x		
Shellfish Harvesting		x		
Spawning, Reproduction and/ or Early Development		x		

3.0 OBJECTIVES

SWAMP monitoring in the San Diego region is intended to provide reliable, high quality information necessary to produce water quality assessment [305(b)] and impaired waters [303(d)] lists that are more comprehensive and more defensible than those of past years. At this time, the primary objectives for SWAMP monitoring in the San Diego region are those identified as numbers 9, 10, and 11 in the "Site Specific Monitoring" section of the SWRCB Report to the Legislature (See Table 8).

These objectives are related to the question of whether aquatic populations, communities, and habitats are protected. There are a number of other questions and objectives pertinent to other beneficial uses of surface waters in the San Diego region. Those questions are being, will be, or should be addressed by other entities and/or other monitoring programs and/or may be included in the SDRWQCB objectives for SWAMP monitoring in the future if/when additional SWAMP funding is available.

Table 8: Monitoring Objectives of SWAMP

Number	Primary Objectives for SWAMP Monitoring
9	At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pollutants, identify specific locations of degraded water or sediments in rivers, lakes, near shore waters, enclosed bays, or estuaries using several critical threshold values of toxicity, water column or epibenthic community analysis, habitat condition, and chemical concentration.
10	At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pollutants, identify specific locations of degraded sediment in rivers, lakes, near shore waters, enclosed bays, or estuaries using several critical threshold values of toxicity, water column or epibenthic community analysis, habitat condition, and chemical concentration.
11	Identify the areal extent of degraded sediment locations in rivers, lakes, near shore waters, enclosed bays, and estuaries using several critical threshold values of toxicity, benthic community analysis, habitat condition, and chemical concentration.

3.1. General Study Design

3.1.1. Overview of General Approach

Given the anticipated funding constraints mentioned above, SDRWQCB staff plans to focus SWAMP monitoring efforts on main stem rivers and streams and major tributaries within the various hydrologic units. If/when additional funding is available in the future, SDRWQCB staff plans to expand SWAMP monitoring efforts to include estuaries, coastal lagoons, bays, harbors, ocean waters, and other waters of the region.

In general, SDRWQCB plans to locate monitoring sites on:

a. Main stem rivers and streams, just above tidal influence;
b. Main stem rivers and streams just above the confluence with major tributaries, and
c. Major tributaries just above the confluence with the main stem rivers and streams.

For various reasons, locations of certain stations may not fit these general rules. The site reconnaissance, which provides assessment beyond the reach scale, will provide the necessary information to support site selection or identify alternate sites that better support the primary objectives discussed above.

All San Diego region SWAMP sampling and analyses will be performed under the SWRCB statewide master contract with the Department of Fish and Game. This arrangement will make use of the monitoring expertise of the Department of Fish and Game and avoid the need for SDRWQB staff to manage a region-specific contract. SDRWQCB staff will conduct site reconnaissance.

Stream flow conditions in the San Diego region vary substantially seasonally (and from year to year). The four planned sampling periods are intended to cover different stream flow conditions, i.e.,

February -	between storm events
April -	high base flow rates
May / June -	declining base flow rates (and bioassessment index period)
September / October -	minimum base flow rates (and bioassessment index period)

There are no surface water flows in some San Diego region streams at certain times of the year. Streams with varying flow regimes drain the Pueblo San Diego, Sweetwater and Tijuana watersheds. In these watersheds, monitoring efforts will be tiered with an emphasis on Winter (February) and

Spring (April) monitoring with fully integrated monitoring limited to selected streams and rivers. As discussed above in Section 1.0, partnerships with other agencies, non-governmental organizations, and Tribal Nations will be sought in January 2005 to expand the planned monitoring in these watersheds.

3.1.2. Water Quality Indicators

In general, SDRWQCB staff plans to use the same suite of indicators at all monitoring sites in the first years of SWAMP. The staff of the SDRWQCB plans to transition to a tiered approach in which SWAMP monitoring at sites lower in a watershed emphasize integrative measures/indicators and to only monitoring some sites for a subset of parameters

In order to accomplish the SWAMP monitoring objectives identified above, SDRWQCB plans to use the indicators (described in the SWRCB Report to the Legislature) listed in Table 9 below. This table also shows the link between the monitoring objectives, indicators and beneficial uses. These indicators will be used in all waterbodies sampled in the Pueblo San Diego, Sweetwater and Tijuana Hydrologic Units.

Additional indicators may be used if/when additional SWAMP funding is available.

Table 9: List of indicators for SWAMP Monitoring

Beneficial Use	Monitoring Objectives[1]	Category	Indicator
Fish and Shellfish Contamination	9 & 10	Contaminant exposure	Fish tissue chemistry Shellfish tissue chemistry Coliform bacteria in shellfish Fecal coliform/Enterococcus in water
Aquatic Life	9, 10 & 11	Biological response	Sediment toxicity Water toxicity
		Pollutant exposure	Shellfish or fish tissue chemistry Nutrients Inorganic and organic water chemistry
		Habitat	Sediment grain size and gradations Hydrogen sulfide (sediment) Ammonia (water)

[1] The number refers to the monitoring objective discussed previously under Section 3.0 (Table 8).

4.0 ACTIVITIES PLANNED FOR FY 2004-05

4.1. List of Water Bodies to be Sampled in FY 2004-05

Water bodies in the San Diego region where SWAMP monitoring is planned in FY 2004-05 are identified in Attachment C.

4.2. Review of Available Information

The SDRWQCB recognizes the need to make better use of information produced by monitoring efforts other than SWAMP and to coordinate and integrate SWAMP monitoring with other monitoring efforts. These non-SWAMP monitoring efforts include:

a. Other SWRCB/RWQCB monitoring programs (e.g., State Mussel Watch Program, Toxic Substances Monitoring Program, other bioaccumulation programs and Bioasssessment);
b. Monitoring conducted in accordance with SWRCB/SDRWQCB regulatory requirements (e.g., receiving water monitoring required by municipal storm water permits);

c. Monitoring conducted in accordance with regulatory requirements of other agencies; and
d. Monitoring conducted independent of regulatory requirements.
e. Monitoring conducted as parts of State grant projects.

At any given level of combined expenditures on monitoring ambient surface waters, better coordination and integration of SWAMP monitoring with these other monitoring efforts will result in more comprehensive information (with respect to space, time, and parameters) about the condition of waters in the San Diego region

Attachment A summarizes some (but not necessarily all) of the ongoing or recent monitoring (other than SWAMP monitoring) in the Pueblo San Diego, Sweetwater and Tijuana hydrologic units (i.e., the three hydrologic units where FY2004-05 SWAMP monitoring will be conducted in the San Diego region). Attachment D summarizes the monitoring efforts of the San Diego Municipal Storm Water Copermittees in the Pueblo San Diego, Sweetwater and Tijuana watersheds.

4.3 Specific Sampling Design / Sample Collection

4.3.1 Site Reconnaissance

Site reconnaissance has been identified as an important tool in effective assessment of ambient water quality monitoring programs. The SDRWQCB will conduct sample site reconnaissance that will:

a. Document local watershed characterization and features;
b. Document in-stream habitat conditions;
c. Document near stream habitat conditions;
d. Measure and characterize flow regime;
e. Identify land ownership and access issues;
f. Establish a California Stream Bioassessment Protocol (CSBP) Reach;
g. Perform a Physical Habitat Assessment;
h. Determine if the site meets reference site criteria for bioassessment;
i. Provide photo-documentation of the site;
j. Record on the ground GPS coordinates for the site;
k. Map the site on both a watershed and reach scale;
l. Identify and prioritize nearby alternate sites for contingency or follow-up monitoring.

For sites in the Pueblo San Diego, Sweetwater and Tijuana hydrologic units the reconnaissance will be completed in the fall of 2004. Attachments B and C have been updated to include available reconnaissance information.

Field location of sample collection sites

The field crew will collect samples at sites where the latitude and longitude (and GPS coordinates) were previously recorded during reconnaissance of these stations. If a new station is being sampled, the latitude and longitude, as well as GPS coordinates and cross-referenced photographs, will be provided for future reference. Any confusion about locating a site or proceeding to a prioritized alternate site will be resolved in consultation with a SDRWQCB staff member present in the field or via phone contact.

4.3.2. Media types and volumes

The numbers of samples of each media type (water, sediment, benthos, and tissue) to be collected are shown in Attachment C.

A sufficient quantity of water, sediment, benthos, or tissue will be collected in order to perform the analyses to be conducted at each station, as well as to allow for archiving of samples for future analysis, as shown in Attachment C. Sample collection and subsequent processing and testing will be performed according to the most recent version of the SWAMP QAPP.

Sediment samples will contain at least 90% fines (silt, mud, and/or clay). The field crew will endeavor to collect enough sediment at sediment collection sites to conduct the grain size, hydrogen sulfide, and toxicity testing (*Hyalella sp.*) on the same sample.

4.3.3. Bioassessment

Samples for bioassessment will be collected using bioassessment protocols found in the San Diego Region Ambient Bioassessment Program[1]. These protocols will be in use until SWAMP has established it's own protocols. Samples will be collected two (2) times (in May/June and October) at twelve (12) monitoring sites, as shown in Attachment C. Each bioassessment site will be surveyed during reconnaissance to select a length of stream that contains at least three (3) [preferably five (5)] riffle-pool sequences. One (1) BMI sample will be collected along a transect in each of three (3) randomly selected riffles, or if only one riffle is available, along three (3) randomly selected transects. Regional Board staff or their partners[2] will conduct all bioassessment sample collection. The California Department of Fish and Game (CDFG) will perform only the analysis of the samples.

The bioassessment samples will have a Quality Assurance/Quality Control (QA/QC) done at a frequency of five percent (5%).

The SDRWQCB has required bioassessment monitoring in several programs that is compatible with the monitoring that will be performed in its SWAMP efforts. This data will be evaluated and may be incorporated in the SWAMP data set.

4.3.4. Conventional Water Chemistry

Samples for conventional water chemistry analyses will be collected four (4) times (February, April, May/June, and September/October) at each monitoring site. The conventional chemistry samples will be collected simultaneously with the "biotic effects" (water toxicity, sediment toxicity, grain size, hydrogen sulfide) samples. This will allow better understanding of the possible causes or nature of any biotic effects observed in the toxicity testing.

4.3.5. Sediment/Water Toxicity Testing (biotic effects)

Samples for "biotic effects" analyses will be collected four (4) times (February, April, May/June, September/October) at eleven (11) monitoring sites, as shown in Table 3. The "biotic effects samples will be collected simultaneously with the conventional chemistry samples at each site.

The "biotic effects" samples will be analyzed for sediment grain size, hydrogen sulfide, and toxicity (*Hyalella sp.*), and freshwater toxicity (*Ceriodaphnia sp.* and, *Selenastrum sp.*). The sample used for freshwater toxicity testing (*Ceriodaphnia sp.* and *Selenastrum sp.*) will be collected near (or within as close a proximity as feasible to) the sediment collection site.

Sediment samples will contain at least 90% fines (silt, mud, and/or clay). The field crew will endeavor to collect enough sediment at sediment collection sites to conduct the grain size, hydrogen sulfide, and toxicity testing (*Hyalella sp.*) on the same sample.

4.3.6. Toxic Substances Monitoring (TSM)

TSM samples will be collected one (1) time (June) at four (4) monitoring sites, as shown in Table 3, for tissue analysis.

---

[1] See http://www.swrcb.ca.gov/rwqcb9/programs/bioassessment.html for more information.

[2] Partners include the County of San Diego and the San Diego Stream Team.

4.4 Laboratory Analysis
Laboratory analyses will be conducted in accordance with standard methods specified in the SWRCB statewide master contract with the Department of Fish and Game. In general, SDRWQCB staff does not anticipate needing special analytical techniques or detection limits. However, detection limits of 0.05µg/L for diazinon and 0.014 µg/l for chlorpyrifos are needed.

Planned laboratory analyses to be performed on samples collected at each planned FY 2004-05 San Diego region SWAMP monitoring site are summarized in Attachment C.

4.5 Data Quality Evaluation and Data Reporting
Data quality evaluation and data reporting will be as specified in the SWAMP QAPP. Quality control will include a 5% field duplicate level for all parameters. SDRWQCB staff does not anticipate needing additional special data quality evaluation or data reporting procedures.

4.6 Deliverable Products
Deliverable products will be as specified by Task Order which is currently only in draft form (Attachment E). SDRWQCB does not anticipate needing special deliverable products.

4.7 Significant dates for sample collection and reporting
The selected monitoring sites in the Pueblo San Diego, Sweetwater and Tijuana hydrologic units are not expected to have surface water flows during all of the planned sampling periods. Therefore, the sampling design for these watersheds (characterized by ephemeral and intermittent streams) will emphasize Winter (February) and Spring (April) sampling followed by Summer (May / June) and Fall (September / October) at sites that support perennial flow. It is hoped that sampling will begin sometime in the spring of 2005.

4.8 "Sample Throughput Schedule"
The sample throughput schedule will be as specified in the SWRCB statewide master contract with the Department of Fish and Game. Although a short turn-around time is desirable, SDRWQCB staff does not want to reduce sampling frequency, the number of sampling sites, and/or the number of parameters in order to reduce turn-around time. SDRWQCB does not anticipate needing a special sample throughput schedule.

4.9 Budget
The planned FY2004-05 SWAMP budget for the San Diego region is summarized in Attachment E. This table has been updated to reflect the revised costs and available resources. It is expected that some funds from FY 2003-04 will not be fully expended due to dry conditions. These funds should roll over to the current task order. The final task order will be amended to reflect the final amount of FY 2003-04 funds that roll over.

5.0 WATERSHED REPORTS
The SDRWQB will prepare watershed reports describing the purpose, scope, methodology, results, data summary, conclusions, and recommendations for the Carlsbad and Los Penasquitos watersheds. The reports will not only provide a summary of the SWAMP data, but will incorporate other monitoring programs and data (e.g., discharger monitoring) as resources become available. The focus of the first round of reports will be to disseminate SWAMP data. However, as more information is incorporated into the SWAMP database, the reports will be used to support other SDRWQCB programs. For example, data will be used during development of the 303(d) list, enforcement actions may be taken to address significant water quality problems, and municipal storm water permits may be modified to address water quality problems. All of the watershed reports will follow the report outline provided in Attachment F.

6.0 PRIORITIZATION

The Prioritization section describes how the SWAMP program will address priorities and provides a mechanism to link the program workplan to these priorities. Four documents were considered in determining priorities:

California Clean Water Partnership Agreement between USEPA Region IX and the SWRCB (Federal Programs Only)
2004 Governor's Action Plan
Strategic Plan
Regional Priorities:
Regional Priorities Documents (created last year)
Priorities Matrix (created earlier this year)

Using simple tables and brief text developed and provided by the SWRCB, the following briefly describes how SWAMP will impact these priorities in Region 9 (see Tables 10, 11 and 12).

6.1 Strategic Plan

The SWAMP monitoring detailed in this 04/05 workplan provides information necessary for addressing Goals number 2 (Surface waters are safe for drinking, fishing, swimming, and support healthy ecosystems and other beneficial uses) and number 6 (Water quality is comprehensively measured to evaluate protection and restoration efforts) of the Water Board Strategic Plan. Further, this workplan identifies several operating principles that are key to promoting and achieving the vision and mission of the Strategic Plan, including internal and external coordination/collaboration activities and collecting the best scientific data possible. Monitoring conducted will be coordinated, comprehensive, and non-duplicative. Water quality data collected will increase the amount of quantitative data and information about water quality conditions. Interpretive final reports will translate quantitative data into useful information regarding the status of water quality into readable reports useful for decision makers and other interested stakeholders. Table 10 lists the priorities that will be addressed by SWAMP in FY 04-05.

Table 10: Strategic Plan

Priority	Applicability	Resource (PY)	Connection
1/1 Employee Training and Retention Project	No		
1/2 E-Government Project	No		
1/3 Priority Project	No		
1/4 Watershed Management	Yes	0.01	Facilitate watershed efforts by implementing SWAMP on a watershed basis
1/5 Compliance/ Enforcement	No		
1/6 Environmental Justice Project	No		
1/7 Cross Media/Cross Organization Project	No		
1/8 Employee Recruitment Project	No		
1/9 Employee	No		

Priority	Applicability	Resource (PY)	Connection
Innovation Project			
2/1 Nonpoint Source (NPS) Project	Yes	0.01	Outreach to NPS program staff
2/2 Listing Impaired Waters	Yes	0.01	Outreach to Basin Planning staff
2/3 TMDL Development and Implementation Project	Yes	0.01	Outreach to TMDL program staff
2/4 Cross Border Project	Yes	0.01	Outreach to agencies conducting monitoring in the southern 60% of the Tijuana River watershed in Mexico.
2/5 Clean Beaches	No		
2/6 Effluent Dominated Waters	No		
3/1 Drinking Water Well Project	No		
3/2 Septic System project	No		
3/3 Seawater Intrusion project	No		
3/4 Brownfields project	No		
4/1 Water Rights Improvement	No		
4/2 Water Transfer	No		
4/3 Water Recycling	No		
4/4 Water Quality/Water Rights Coordination	No		
5/1 Outreach	Yes	0.1	Coordination of SWAMP and data with watershed stakeholders
6/1 SWAMP	Yes	0.7	Implementation of SWAMP workplan
6/2 Groundwater Ambient Monitoring	No		
6/3 SWIM 2	No		

6.2 USEPA and SWRCB Partnership Agreement

The California Clean Water Partnership between the United States Environmental Protection Agency (USEPA) and the SWRCB has four main objectives to improve water quality: implement the law, improve efficiency of regulatory programs, target critical problems, and address concerns of the public. This has led to the development of a Five-Year Strategy Agreement (2003-2008) for surface water programs. The SDRWQCB's SWAMP monitoring program will achieve many of these goals. Section B, Category 1 tasks include development of a SWAMP implementation plan consistent with USEPA's "Elements of an adequate state ambient water monitoring and assessment program", implementation of a statewide Quality Management Plan, and biennial overall assessment of waters of the state. The SDRWQCB's SWAMP monitoring program has been designed with USEPA's guidance in mind and incorporates standard QA/QC methods. The regional SWAMP monitoring data can be integrated into a statewide assessment of water quality.

Category 2 tasks include development of ambient data formats, tracking of water quality improvements, assessment of probabilistic monitoring for freshwater systems, application of regional monitoring and assessment frameworks to other areas of the state, and integration of National Pollution Discharge Elimination System (NPDES) monitoring into ambient monitoring programs. The SDRWQCB has considered existing NPDES monitoring programs with ambient monitoring to avoid duplication of effort and development effective, efficient SWAMP monitoring programs for those watersheds with major NPDES dischargers. Our SWAMP monitoring design is based on sampling each watershed in the San Diego region on a five-year cycle, which will provide a means to track water quality improvements and evaluate the effectiveness of federal, state and local management activities designed to eliminate impairments and improve water quality in state waters. Standard ambient data formats are being used, as they are developed, to facilitate the exchange of data between SWRCB, the RWQCBs, USEPA and other interested parties. Table 11 lists the priorities that will be addressed by SWAMP in FY 04-05.

Table 11: USEPA and SWRCB Partnership Agreement

Priority	Applicability	Resource (PY)	Connection
A. Basin Planning			
Triennial Review (Category 1)	Yes	0.01	Provide SWAMP data to assist Basin Plan staff
Water Quality Standards (Cat II)	Yes	0.01	Provide SWAMP data to assist Basin Plan staff
Ocean Plan Bacteria Standards (Cat II)	No		
Basin Plan Efficiency (Cat II	No		
SIP (Cat II)	No		
Bioassessment Program (Cat II)	Yes	0.01	Assist State Board staff by providing SWAMP bioassessment data
B. SWAMP			
SWAMP Implementation Plan (Cat I)	Yes	0.7	Implementation of SWAMP workplan
QMP (Cat I)	Yes	0.01	Assist State Board staff
305 (b) report (Cat I)	Yes	0.01	Assist State Board staff
Standardized Data Format (CatII)	Yes	0.01	Assist State Board staff
Water Quality Improvements Project (Cat II)	Yes	0.01	Assist State Board staff
EMAP (Cat II)	Yes	0.01	Assist State Board staff
Monitoring & Assessment Framework (Cat II)	Yes	0.01	Assist State Board staff
NPDES Monitoring Data (Cat II)	Yes	0.01	Assist State Board staff
C. Nonpoint Source			
NPS Plan Implementation (Cat I)	No		
NPS Plan Development (Cat I)	No		
NPS Report (Cat II)	No		
Management Measure Guidance (Cat II)	No		
CCC (Cat II)	No		
IACC (Cat II)	No		
Grant Funds (Cat II)	Yes	0.01	Outreach to ensure grant funded monitoring

Priority	Applicability	Resource (PY)	Connection
			conforms to SWAMP QAPP and that SWAMP efforts are coordinated with grant projects.
Information Transfer (Cat II)	No		
Program Coordination (Cat II)	No		
D. TMDL			
303 (d) List (Cat I)	No		
TMDL Guidelines (Cat I)	No		
303(d) Policy (Cat II)	No		
TMDL 2005-08 List (Cat II)	No		
Program Workplan (Cat II)	No		
Adopt TMDLs (Cat II)	No		
TMDL Protocol (Cat II)	No		
USEPA Support (Cat II)	No		
E. NPDES Storm Water			
All Cat I activities	No		
All Cat II activities	No		
F. NPDES Wastewater			
All Cat I activities	No		
All Cat II activities	No		
G. Pretreatment			
All Cat I activities	No		
All Cat II activities	No		
H. Compliance / Enforcement			
All Cat I activities	No		
All Cat II activities	No		
I. Concentrated Animal Feeding Operation			
All Cat I activities	No		
All Cat II activities	No		
J. Data Management			
All Cat I activities	No		
All Cat II activities	No		
K. QA/QC			
Strategy to address EPA QA Summary Report (Cat II)	No		
L. State Revolving Fund			
All Cat I activities	No		
All Cat II activities	No		

6.3 Governor's Action Plan

The Governor's Action Plan calls for clean-up of the most endangered watersheds, ensuring that existing permitting fees are targeted toward resource management, protection of ground water, surface water and coastal waters from pollution, wetlands protection, and establishment of Environmental Protection Indicators for California (EPIC) for each action item identified by the

plan. The SDRWQCB's SWAMP monitoring program will help identify endangered watersheds in the region and will be linked with other programs that will result in protection of surface waters and coastal waters from various sources of pollution. The SWAMP program is funded by discharger fees, which are being used for resource management. The SWAMP monitoring of surface waters that drain into major wetlands will lead to wetlands protection by identifying areas that require water quality improvements. Already SWAMP monitoring in southern California has led to the development of a bioassessment index, which could be used as a biological indicator of the health of surface waters for the EPIC program. Table 12 lists the priorities that will be addressed by SWAMP in FY 04-05.

Table 12: Governor's Action Plan

Priority	Applicability	Resource (PY)	Connection
Fill any gaps in wetlands protection and support the successful collaborative wetland restoration efforts and public-private partnerships already underway throughout California and the West.	No		
Protect the State's waters by implementing science based standards to protect public health	No		
Promote enhanced stormwater mitigation techniques near waterways, facilitate accelerated repair of leaking sewer systems, and fully implement existing water quality programs, such as municipal, industrial and construction stormwater permit programs and TMDL programs.	Yes	0.1	Collection and distribution of SWAMP data to regulated community and other stakeholders provide support information to make informed decisions
Protect the state's groundwater, surface waters and coastline from industrial and agricultural pollution, sewage, storm water pollution, nonpoint source runoff and other sources of contaminants, relying on science-based standards to protect public health	Yes	0.1	Collection and distribution of SWAMP data to regulated community and other stakeholders provide support information to make informed decisions
Promote practices that help farmers reduce their pollution in cost-effective ways and help them comply with environmental requirements.	No		
Regional Priorities			
Prevention of and mitigation for Loss of aquatic habitat	No		
Abate degradation of municipal and domestic groundwater supplies	No		
Reduction in beach closures	No		
Develop or upgrade ambient monitoring	Yes	0.7	Implementation of SWAMP workplan

7.0 WORKING RELATIONSHIPS

The decision matrix shown in the SWRCB SWAMP Guidance for Site-Specific Monitoring Workplans is appropriate for the SWAMP monitoring to be conducted in the San Diego region. It is reproduced below (Table 13) and describes the general relationships for implementing the regional monitoring portion of SWAMP.

Table 13: Working Relationships

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
Develop contract(s) for monitoring services.	●	●	●
Identify water bodies or sites of concern and clean sites to be monitored.		●	
Identify site-specific locations with potential beneficial use impacts or unimpacted conditions that will be monitored.		●	
Decide if concern is related to objectives focused on location or trends of impacts.		●	
Select monitoring objective(s) based on potential beneficial use impact(s) or need to identify baseline conditions.		●	
Identify already-completed monitoring and research efforts focused on potential problem, monitoring objective, or clean conditions.		●	●
Make decision on adequacy of available information.		●	●
Prepare site-specific study design based on monitoring objectives, the assessment of available information, sampling design, and indicators.	● (Work Plan (Review Role)	●	●
Implement study design. (Collect and analyze samples.)			●
Track study progress. Review quality assurance information and make assessments on data quality. Adapt study as needed.	● (Review Role)	●	●

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
Report data through SWRCB web site.	●	● (Coordina-tion Role)	●
Prepare written report of data.	●	●	●

7.1. Inter-agency and Organizational Coordination
The SDRWQCB SWAMP staff are currently in coordination with other units of the Regional Board collecting data from coastal streams and in nearshore areas. Table 14 summarizes these other monitoring activities.

Table 14. Other Regional Board Monitoring Activities at Work in Coastal Confluences and Watersheds in the San Diego Region.

Agency Group	Monitoring Program Description	Available Data Format	Using SWAMP QAPP	Data SWAMP compatible	Data used for 303(d) & 305(b)
TMDL	TMDL monitoring for loading assessments in Region 9 streams and in San Diego Bay.	Data currently being collected and planned over the next several years. R9 has most data available in electronic format. It has not yet been determined if the data is SWAMP compatible.		?	Y
NPDES Storm Water Monitoring	Wet weather sampling occurs during 3 storm events at Mass Loading stations. Dry weather sampling happens throughout the region.	Data is submitted in paper files and on a compact disc. Data is not yet in a format that is easily entered into the SWAMP database.	Y		Y
Grant Projects	Grantees are required to meet with Region 9 staff in the first quarter of the grant, to discuss development of the QAPP, Monitoring Plan, and data management.	Data will be submitted in electronic format using SWAMP templates.	Y	Y	Y

7.2. Inter-agency and Organizational Coordination
The SDRWQCB SWAMP staff are currently in coordination with several local agencies and organizations collecting data from coastal streams and in nearshore areas. Table 15 summarizes monitoring activities that are underway in watersheds monitored by SWAMP.

Table 15. Monitoring Organizations and Activities at Work in Coastal Confluences and Watersheds in the San Diego Region.

Federal	Monitoring Activities	Coordination Status
La Jolla Indian Tribe	Water quality monitoring on the San Luis Rey River.	Data and information have been exchanged.
Tijuana National Estuarine Research Reserve	Ambient water quality monitoring in the Tijuana Estuary.	Data acquired.
United States Forest Service	Previous sampling conducted in Pine Valley Creek for bacterial indicators.	Data acquired. Access to sites under their jurisdiction.
State		
State Mussel Watch Program (SMW) and Toxic Substances Monitoring Program (TSM)	Monitoring in association with SWAMP watershed rotation area program through 2003. Program terminated in 2003 due to budget cuts.	Data acquired.
California State Parks – Rancho Cuyamaca and Palomar Mountain	None known.	Access to sites under their jurisdiction.
Local		
City of San Diego Water Department	Numerous sites in and near reservoirs monitored for various constituents.	Data and information have been exchanged
County of San Diego Watershed Protection Program	Monitoring of several waterbodies for numerous constituents during wet and dry weather.	Data and information have been exchanged. County staff have assisted in the collection of bioassessment samples.
Escondido Creek Conservancy		Information exchanged.
Project Clean Water – Science and Technology TAC		Forum for dissemination of SWAMP information.
Volunteer		
San Diego Stream Team (SDST)	Collection and analysis of macroinvertbrate bioassessment samples through out San Diego County.	The SDST have collected samples for the SWAMP program; with analysis by CDFG

8.0 LIST OF ATTACHMENTS

- Attachment A List of Data Sources in the 908, 909 and 911 Hydrologic Units
- Attachment B SWAMP Monitoring Sites in the San Diego Region
- Attachment C Planned SWAMP Monitoring Sites in the San Diego Region in FY 04 - 05
- Attachment D Summary of San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring
- Attachment E Draft Task Order for FY 04-05 Sampling in the San Diego Region
- Attachment F Outline of Watershed Report

Note: Attachments A, C and E are contained in file "04_05 Attchmnts A, C, E.xls"

ATTACHMENT B - SAN DIEGO REGION SWAMP MONITORING SITES

SWAMP Year 1 (FY 2000-01)	Rain Year Sampled 2001-02
Los Penasquitos Watershed	**(6 Stations)**
Los Penasquitos Creek	1
Tecolote Creek	1
Rose Creek	1
Poway Creek (Alternate)	1
Soledad Canyon Creek	1
Rattlesnake Creek	1
Carlsbad Watershed	**(9 Stations)**
Escondido Creek	2
Loma Alta Creek	1
San Marcos Creek	1
Encinitas Creek	1
Cottonwood Creek	1
Aqua Hedionda Creek	1
Buena Vista Creek	1
Buena Creek	1

Sampling Design: Fully Integrated.
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: None.
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Ambient Bioassessment Monitoring Program.

SWAMP Year 2 (FY 2001-02)	Rain Year Sampled 2002-03
San Juan Watershed	**(9 Stations)**
Aliso Creek	1
San Juan Creek	2
Arroyo Trabuco	1
Oso Creek	1
Bell Canyon Creek	1
Laguna Canyon Creek	1
Moro Canyon Creek	1
English Creek	1
Otay Watershed	**(2 Stations)**
Jamul Creek	1
Poggi Canyon Creek	1

Sampling Design: Fully Integrated
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: City of San Diego, County of San Diego, County of Orange, Otay Water District.
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Ambient Bioassessment Monitoring Program.

SWAMP Year 3 (FY 02/03)	Rain Year Sampled (03/04)
Santa Margarita Watershed	**(5 Stations)**
Deluz Creek	1
Rainbow Creek	1
Santa Margarita River	2
Sandia Creek	1
San Dieguito River Watershed	**(5 Stations)**
Cloverdale Creek	1
Green Valley Creek	1
Santa Ysabel Creek	2
San Dieguito River	1

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: Santa Margarita River Watershed Monitoring Framework, City of San Diego, County of San Diego, County of Riverside, Mission Resource Conservation District (RCD), San Diego County Water Authority, San Dieguito Municipal Water District, Tribes (?).
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish

SWAMP Year 4 (FY 03/04)	Rain Year Sampled (04/05)
San Luis Rey River Watershed (903)	**(6 Stations)**
Gird Creek	1
Iron Springs Creek	1
Keys Creek	1
Moosa Creek	1
San Luis Rey River	2
San Diego River Watershed (907)	**(9 Stations)**
Alpine Creek	1
Alvarado Creek	1
Boulder Creek	1
Chocolate Creek	1
Forester Creek	1
Los Coches Creek	1
San Diego River	2
San Vicente Creek	1

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: City of San Diego, Mission RCD, Vista Irrigation District, USFS, and Tribes (?).
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish.

SWAMP Year 5 (04/05)	Rain Year Sampled (05/06)
Tijuana River Watershed	**(3 Stations will be sampled)**
Cottonwood Creek	2
Tijuana River	2
Pine Creek	1
La Posta Creek	1
Kitchen Creek	1
Campo Creek	1
Wilson Creek	1
Sweetwater Watershed	**(3 Stations will be sampled)**
Sweetwater River	3
Cold Stream	1
Lawson Creek	1
Harbison Canyon Creek	1
Peterson Creek	1
Pueblo San Diego Watershed	**(1 Station will be sampled)**
Chollas Creek	1
Chollas Creek Tributary	1
Paradise Creek	1
Telegraph Canyon Creek	1

Stream	Latitude	Longitude	Sampling Periods
Pueblo San Diego Hydrologic Unit			
Chollas Creek (CHL 4)	32.69629°	117.12237°	February, April, May/June, Sep/Oct
Chollas Creek Tributary (CHL 3)	32.72730°	117.06977°	February, April, May/June, Sep/Oct
Paradise Creek (PAR 4)	32.67115°	117.10303°	February, April, May/June, Sep/Oct
Telegraph Canyon Creek (TEL 2)	32.62860°	117.06288°	February, April, May/June, Sep/Oct
Sweetwater Hydrologic Unit			
Cold Stream (CLD 2)	32.94003°	116.56444°	February, April, May/June, Sep/Oct
Harbison Canyon Creek (HAR 2)	32.81028°	116.84278°	February, April, May/June, Sep/Oct
Lawson Canyon Creek (LAW 2)	32.75417°	116.77861°	February, April, May/June, Sep/Oct
Peterson Creek (PET 2)	32.79468°	116.74174°	February, April, May/June, Sep/Oct
Sweetwater River (SWR 3)	32.83508°	116.62254°	February, April, May/June, Sep/Oct
Sweetwater River (SWR 7)	32.73306°	116.94083°	February, April, May/June, Sep/Oct
Sweetwater River (SWR 8)	32.65861°	117.04278°	February, April, May/June, Sep/Oct
Tijuana Hydrologic Unit			
Campo Creek (CAM 1)	32.58928°	116.51797°	February, April, May/June, Sep/Oct

Cottonwood Creek (CWD 10)	3257500°	116.75389°	February, April, May/June, Sep/Oct
Cottonwood Creek (CWD 3a)	32.78608°	116.49596°	February, April, May/June, Sep/Oct
Kitchen Creek (KTC 5)	32.75390°	116.45128°	February, April, May/June, Sep/Oct
La Posta Creek (LAP 4)	32.69992 °	116.47914°	February, April, May/June, Sep/Oct
Pine Creek (PVC 1)	32.83657°	116.54196°	February, April, May/June, Sep/Oct
Tijuana River (TJR 1)	32.56556°	116.77167°	February, April, May/June, Sep/Oct
Tijuana River (TJR 5)	32.55132°	116.08439°	February, April, May/June, Sep/Oct
Wilson Creek (WLC 3)	32.69361°	116.69528°	February, April, May/June, Sep/Oct

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM, Mussel Watch Parameters.
Partners: City of San Diego, Sweetwater Authority, USFS, and Tribes (?)
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Mussel Watch.

ATTACHMENT D - SUMMARY OF SAN DIEGO COUNTY MUNICIPAL COPERMITTEES 2002-2003 URBAN RUNOFF MONITORING

Copermittee monitoring represents one of the largest sources of data in the 908, 909 and 911 watersheds. This summary does not include the Ambient Bay and Lagoon monitoring, and the Coastal Storm Drain outfall monitoring.

1. STORM WATER MASS LOADING MONITORING

Mass Loading Stations sites

Chollas: Located on the north fork of Chollas Creek near the intersection of 33rd and Durant Streets, just east of the Durant Street cul-de-sac in the City of San Diego. 1290 F-4,

Sweetwater: Located in Bonita, north of Bonita Road, under the Plaza Bonita Road Bridge. 1310 D-4

Tijuana: Under the Hollister street Bridge. 1350 B-4

Mass Loading Stations Analytes

General Physical and Inorganic Non-Metals: Total Dissolved Solids, Total Suspended Solids, Turbidity, Total Hardness, pH, Specific Conductance, Temperature, Dissolved Phosphorus, Total Phosphorus, Nitrate and Nitrite, Total Kjeldahl Nitrogen, Ammonia as N, 5-day Biological Oxygen Demand, Chemical Oxygen Demand, Dissolved Organic Carbon, Total Organic Carbon, Methylene Blue Active Substances

Organics: Oil and Grease, Diazinon, Chlorpyrifos,.

Metals, Dissolved: Antimony, Arsenic, Cadmium, Chromium, Copper, Lead Nickel, Selenium, Zinc

Metals, Total: Antimony, Arsenic, Cadmium, Chromium, Copper, Lead Nickel, Selenium, Zinc

Bacteriological: Total Coliform, Fecal Coliform, Enterococcus

Toxicity: 7-day chronic test with the cladoceran *Ceriodaphnia dubia*, Chronic test with the freshwater **Algae** *Selenastrum capricornutum*, Acute survival test with the amphipod *Hyalella azteca.*

Organochlorine Pesticides: Azinphosmethyl, Bolstar, Chlorpyrifos (Dursban), Couaphos, Def, Demeton (Total), Diazinon, Dichlorvos, Dimethoate, Disulfoton, EPN, EPTC, Ethion, Ethoprop, Gensulfothio, Genthion, Malathion, Merphos, Mevinphos, Naled, Paration-ethyl, Parathion-methyl, Phorate, Prowl, Ronnel, Stirophos, Sulfotep, tokuthion, Trichloronate, Trifluralin.

Semivolatile Organic Compounds: Acenaphtene, Acenaphthylene, Anthracene, Benzidine, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,i]perylene, Benzo[a]pyrene, Benzyl alcohol, Bis(2-chloroethoxy)methane, Bis(2-chloroethyl)ether, Bis(2-ethylhexyl)phthalate, 4-Bromophenyl phenyl ether, Butyl benzyl phthalate, Carbazole, 4-Chloroaniline, 4-Chloro-3-methylphenol, 2-Chloronaphthalene, 2-Chlorophenol, 4-Chlorophenyl phenyl ether, Chrysene, Dibenzo[a,h]anthracene, Dibenzofuran, Di-n-butyl phthalate, 1,2 –Dichlrobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 3,3'-Dichlorobenzidine, 2,4-Dichlorophenol, Dimethyl phthalate, 4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-n-octyl phthalate, Fluoranthene, Flourene, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane, Indeno (1,2,3-cd) pyrene, Isophorone, 2-Methylnapthalene, 2-Methylphenol, 4-Methylphenol (3-Methylphenol), Napthalene, 2-Nitroaniline, 3-Nitroaniline, 4-Nitroaniline, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, N-Nitrosodiphenylamine, N-Nitrosodi-n-propylamine, Pentachlorophenol, Phenathrene, Phenol, Pyrene, Pyridine, 1,2,4-Trichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol.

Mass Loading Stations Monitoring Frequency

During 3 storms only, no dry weather
Chollas: 11/08/02, 2/11/03, 2/25/03

Sweetwater: 12/16/02, 2/11/03, 2/25/03
Tijuana: 11/08/02, 2/11/03, 2/25/03

2. BIOASSESSMENT

Bioassessment sites

Chollas: 5 riffles downstream of Federal Boulevard, 1290 C-1 (32 43.606, 117 04.219)

Sweetwater: Sweetwater River 3 riffles at the Highway 94 crossing, 1271 J-7 (32 43.962, 116 56.418)
Long Canyon Creek, 5 riffles along Acacia Avenue, 1310 J-3, 1311 A-3 & 4, (32 39.394, 117 00.800)
Sweetwater River, 5 riffles downstream of Bonita Road, 1310 J-1 (32 39.436, 117 02.717)

Tijuana: 5 riffles upstream of Dairy Mart Road, 1350 D-5 (32 32.816, 117 03.741)

Bioassessment Analytes

Taxonomic listing of all benthic macroinvertebrates identified.
Calculation of biological metrics listed in the California Stream Bioassessment Procedure.
Index of Biotic Integrity.
Physical habitat Quality Assessment, water temperature, specific conductance, pH, dissolved oxygen, chlorophyll, stream flow velocity, elevation.

Bioassessment Frequency

Three surveys taken: May 2002, October 2002, May 2003

3. DRYWEATHER MONITORING

Dry weather sites

Only those sites are listed where surface waters were sampled without tidal influence, i.e. channels, creeks, manmade or natural. The Port District's dry weather monitoring data was not reviewed for this summary.

Pueblo San Diego:

NC1A – Southwest of the 43rd Street and Nordica Avenue intersection, concrete open channel (Paleta creek?), 1289 H-7
NC20 – Southeast of Palmer Way Middle School east of Lanoitan Avenue, north of East 14th Street, Earthen Open Channel, 1310 B-1
NC44 – North of 16h Street, east of National City Boulevard, inside Kimball Park, under the bridge, concrete open channel (Paradise creek?) 1309 H-2
NC49 – South end of Arcadia Place (through Harbison Avenue and 11th Street), Open channel, 1290 B-7
LM14* - Boulevard Drive, east of 69th Street (University Channel), Natural Channel, 1270 E-4
LG2 – Behind the building at 6420A Federal Boulevard, Open Channel, 1270 D-7
LG3 – Next to 6691 Federal Boulevard, Open Channel, 1270 E-7
LG15 – 6636 Federal Avenue, in front of Thompson Building Materials, 1270 E-7
City: 72 sites in San Diego Bay Watershed, which includes Pueblo San Diego, Otay and

Sweetwater Watersheds. The city report does not provide a description of every station, but the location on some sites where a follow-up investigation was conducted.
DW205 – At Imperial Avenue and Chollas Creek, 1289 F4
DW239 – Near the train tracks at Kalmia, 1288 J1

Sweetwater: NC40 – South of Sweetwater Road, west of Calmoor Street, Concrete Open Channel, 1310 D-3
NC41 – North of San Miguel Court and Valley Road, within Park Bonita Apartments, Earthen open Channel, 1310 E-3

LM 55 – Bancroft Dr., Madison Ave., east of residential address. 9132, Natural Channel, 1271 B-2
CV BLC-01 – Chula Vista Municipal Golf Course, N. of the intersection of Bonita Road and Acacia Avenue, Open Channel. 1310 J-2
CV BLC-02 – Long Canyon Channel, S. of Bonita Road and W. of the southern end of Acacia Avenue, open gabion channel. 1311 A-4
CV CEN-01 – S. of "H" Street and E. of Interstate 5 and Trolley Tracks, open concrete channel. 1329 J-1
CV SUN-03 – Chula Vista Municipal Golf Course, S.W. of Bonita Road and Central Avenue, open channel. 1310 J-2.
CV TCC-02 – Telegraph Canyon Channel, W. of Hilltop Drive and Telegraph Canyon Road, at Hilltop Park, open channel. 1330 D-1.
CV TCC-04 – Telegraph Canyon Channel, W. of Third Avenue and S. of "L" Street, under Mobil Gas Station, open channel. 1310 C-2
CV TCC-06 – Telegraph Canyon Rd. and Paseo Del Ray intersection, north west of the intersection, open concrete channel. 1330 G-1
CV WIL-01 –Chula Vista Municipal Golf Course, S. of Sweetwater Road, 100' E. of Willow Street, open channel. 1290 G-3.
CV CEN-05 – W. of Second Avenue between "G" Street and "H" Street, open channel. 1310 C-6
CV CEN-07 – W. of Fifth Avenue, between Center Street and Park Way, open concrete channel. 1310 A-6
CV MGC-02 – W. of Chula Vista Municipal Golf Course at S.E. corner of Willow Street Bridge, earthen channel. 1290 F-3

County of San Diego:

SWT-01 – Willow Road @ Sweetwater River, open natural channel, 1310 F3
SWT-02 – Acacia Avenue @ Bonita Road open natural/concrete channel, 1310 J2
SWT-03 – Plaza Bonita Road @ Sweetwater River, open natural channel, 1310 D4
SWT-05 – San Miguel Creek @ Bonita Road, open natural/rock rip-rap channel, 1310 J2
SWT-07 – Quarry Road @ Swap Meet Road, open natural channel, 1291 A4
SWT-08 – Valencia Street @ Casa de Oro Creek, open concrete channel, 1271 A7
SWT-09 – Spring Valley Creek @ Valencia Street, open concrete channel, 1271 A7
SWT-10 – Jamacha Road @ Willow Glen, open natural channel, 1272 A5
SWT-11 – Steele Canyon Road @ Sweetwater River, open natural channel, 1272 C5
SWT-12 – Old Bridge @ Sweetwater River, open natural channel, 1271 J7
SWT-13 – Millar Ranch Road @ Highway 94, open natural channel, 1271 J7
SWT-14 – Helix Street, next to Highway 94, open natural channel, 1271 B5
SWT-15 – Kenwood Drive @ Barbic Court, open natural/rock rip-rap channel, 1271 C5
SWT-16 – Vista Sage Lane @ Campo Road, open natural/rock rip-rap channel, 1292 F1
SWT-18 – Harbison Canyon @ Collier Way, open natural/rock rip-rap channel, 1253 C2
SWT-19 – Viejas Creek Road @ Viejas Creek, open natural/rock rip-rap channel, 1234 F6
SWT-20 – Via Viejas @ Private Lake, open natural, 1254 C1
SWT-21 – Tavern Road @ Real Way Lane, open natural/concrete channel, 1253 J2
SWT-22 – Indian Springs Drive @ Highway 94, open natural/rock rip-rap channel, 1292 G1
SWT-23 – Jamul Road @ Mexican Canyon Creek, Open natural channel, 1272 H7
SWT-25 – Jamacha Boulevard-Highway 94 @ Campo Road, open rock/rip-rap/natural channel, 1271 H6
SWT-26 – Sweetwater River at Reservoir Cup Stream, open natural/wetland channel, 1291 H2
City: 72 sites in San Diego Bay Watershed, which includes Pueblo San Diego, Otay and Sweetwater Watersheds. The city report does not provide a description of every station, but the location on some sites where a follow-up investigation was conducted.

Tijuana: IB M4 – open concrete channel, South of Iris Avenue, W. of 13th St., 1349 H2

County:

TIJ-01 – Cottonwood Creek @ Old Highway 80 (Bridge Crossing), open natural channel, 430 A6

TIJ-02 – Pine Creek Road @ Old Highway 80, open natural channel, 1237 A5

City: 9 sites in Tijuana Watershed. The city report does not provide a description of sites, but does provide a location on only those where a follow-up investigation was conducted.

DW222 – South end of Valentino St., 1350 D-3

DW223 – South end of Rodear Rd., 1350 A-3

DW224 – Just South of the Imperial Beach Border Patrol Station, S. of Leon Av. and Boundary Rd., 1349 J3

Dry weather Analytes

PH, Turbidity, Conductivity, Nitrate, Ammonia, Phosphorus, MBAS, Oil and Grease, Dissolved Cadmium, Dissolved Copper, Dissolved Lead, Dissolved Zinc, Diazinon, Chlorpyrifos, Total Coliform, Fecal Coliform, Enterococcus.

Dry weather Frequency

The San Diego MS4 permit requires dry weather monitoring at each identified station at least once between May 1st and Sept. 30th of each year.

ATTACHMENT F - OUTLINE OF THE WATERSHED REPORTS

1) Introduction
   a) Purpose of Report
   b) Organization of Report

2) Background
   a) Description of Watershed
      i) Provide map
      ii) Identify major water bodies
      iii) Hydrologic characteristics of water bodies
      iv) Identify beneficial uses including noteworthy aquatic habitat
      v) Identify water quality impairments
      vi) Land use and political boundaries
      vii) Noteworthy restoration efforts, preserves, etc.

   b) Description of monitoring conducted in watershed
   c) Describe programs and studies that have recently been completed, or are underway or planned by the SDRWQCB or other stakeholders to assess water quality/beneficial uses of ground and surface water quality in the watershed and the conclusions of the reports or status of the studies. For example: 303(d) list, Surface Water Ambient Monitoring Program (SWAMP), Ambient Bioassessment Monitoring Program, Groundwater Ambient Monitoring and Assessment (GAMA) Program, DWR/USGS groundwater studies, Stream Teams, NPDES receiving water monitoring, etc. etc.

3) SWAMP
   a) SWAMP Purpose and Objectives
      i) Provide reliable, high quality information necessary to produce water quality assessment [305(b)] and impaired waters [303(d)] lists that are more comprehensive and more defensible than those of past years.
      ii) Identify specific locations and geographic extent of degraded water or sediments in waterbodies using several threshold values of toxicity, water column, or epibenthic community analysis, habitat condition, and chemical concentration.
      iii) Answer the question "Are aquatic populations, communities, and habitats protected?"
   b) Methodology
      i) Sample locations, times, field work (e.g. identify locations, sample handling), laboratory methods - the majority of this information can be taken from the work plan.
      ii) Identify threshold values (see Purpose and Objectives 1a).
      iii) Describe methodology (e.g., triad approach) that will be used to determine if aquatic populations, communities, and habitats are protected.
   c) Results
      i) Summary tables and plots of SWAMP data - develop templates for data presentation for consistency between watersheds.
      ii) QA/QC information if necessary
   d) Analysis
      i) Compare SWAMP results to threshold values.
      ii) Trends?
      iii) Power analysis?
      iv) Seasonal or location differences?
   e) Conclusions
      i) Were SWAMP purpose and objectives successfully met?

f) Recommendations
    i) If SWAMP purpose and objectives are not being met, why weren't they met and what can be changed to ensure they are met in the future?

4) Other Monitoring - will have separate sections for each program that is included in this section. Programs will be added as time and resources allow. Programs to add include: municipal storm water, NPDES monitoring, POTW, grant projects.
    a) Purpose and Objectives
    b) Methodology
    c) Results - for the municipal storm water program, this can be taken from the annual report
    d) Analysis - compare and contrast program data to SWAMP data, analysis, conclusions, and recommendations
    e) Conclusions
    f) Recommendations - Are there opportunities to maximize sampling with changes in required monitoring programs?

5) Recommendations - This section will address the steps we should take to further the value of the SWAMP program, as well as overall monitoring in our region. Potential issues to address include:
    a) Based on the data and 5-year sampling cycle, what can we change to maximize the resources we have?
    b) What actions should/could be taken with the current data? - For example, were there sufficient data to support a 303(d) listing or should a 13267 directive be issued?
    c) How can the SWAMP program compliment other sampling efforts?
    d) What additional SWAMP resources are necessary to meet our purpose and objectives?