FY 03-04 Workplan
Surface Water Ambient Monitoring Program (SWAMP)
Lahontan Region

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EXECUTIVE SUMMARY

The Surface Water Ambient Monitoring Program (SWAMP) was created by the California Legislature in fiscal year 2000-2001. The program relies primarily on contractors to collect information about the quality of the State's waters. Each RWQCB receives an annual contract allocation, and modest funding for staff to oversee the program. This is the FY03-04 workplan for RWQCB-6 (Lahontan Region).

This workplan assumes approximately 1 staff position (PY) and $379,950 in contract funds for Region 6's SWAMP program in FY 03-04. This is far less than the funding that would be needed to implement the comprehensive monitoring program originally proposed by the SWRCB in its Report to the Legislature.[1] Given the limited funding, staff of the Lahontan RWQCB plans to continue the Region's existing water column sampling and bioassessment programs. The following table depicts the breakdown of planned contract expenditures:

Contract Purpose	Contractor	Amount
Surface water sampling	U.S. Geological Survey	$138,000
Bioassessment	U.C. Santa Barbara (SNARL)	$175,000
Student Assistants	Community College Foundation	$30,000
Data Management & Analyses	Moss Landing Marine Lab	$36,950
	TOTAL	**$379,950**

U.S. Geological Survey, $138,000

The USGS will conduct quarterly sampling at approximately twenty sites. Because funding is not sufficient to fully implement the detailed "rotating-basin watershed assessments" envisioned in the Report to the Legislature and the SWRCB's Strategic Plan, the Lahontan Region relies on a region-wide network of "integrator" sites situated near the bottom of watersheds. The suite of analytes tested at each site is based primarily upon the applicable Basin Plan objectives for that site, so information gathered can be directly compared to relevant water quality standards.

U.C. Santa Barbara, Sierra Nevada Aquatic Research Lab (SNARL), $175,000

The UCSB-SNARL will continue its on-going efforts to establish "reference conditions" for streams, and to develop indices of biological integrity (IBIs) based on instream community assemblages. IBIs are a powerful tool for assessing the biological integrity of streams, and will be developed over time to cover various parts of the Region. (The size and diversity of the Lahontan Region requires the development of multiple IBIs.) The Region's bioassessment program primarily utilizes benthic (bottom-dwelling) macroinvertebrates, but a pilot program is also being conducted to explore the utility of using algae assemblages as cost-effective indicators of pollution.

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[1] *See* "Proposal for a Comprehensive Ambient Surface Water Monitoring Program–Report to the Legislature," November 2000. http://www.swrcb.ca.gov/legislative/docs/swrcb_monitoring_rpt1100.pdf

<u>Community College Foundation, $30,000</u>
Student Assistants (both graduate and undergraduate) will be hired to aid with data entry and analyses. As time allows, Student Assistants may also perform field sampling duties.

<u>Moss Landing Marine Lab (through CDFG Master Contract), $36,950</u>
The team of scientists at MLML that is building the state-wide SWAMP database will perform the following tasks, funded by Region 6: (1) develop conversion routines so that data from USGS can be automatically loaded into the state's SWAMP database; (2) enter historic and future USGS data from Region 6 into the SWAMP database; (3) modify the SWAMP database so it can accept bioassessment data from Region 6, and train Region 6's bioassessment contractor (UCSB-SNARL) to use the database; and (4) assist with data analyses.

Introduction

History and Background

The Porter-Cologne Water Quality Control Act and the federal Clean Water Act direct that water quality protection programs be implemented to protect and restore the chemical, physical, and biological integrity of the state's waters. California Assembly Bill 982 (Water Code Section 13192; Statutes of 1999) required the State Water Resources Control Board (SWRCB) to assess and report on the State's water quality monitoring programs.

AB 982 envisioned that ambient monitoring would be independent of other water quality regulatory programs, and serve as a measure of: (1) the overall quality of the State's water resources, and (2) the overall effectiveness of the prevention, regulatory, and remedial actions taken by the SWRCB and the nine Regional Water Quality Control Boards (RWQCBs). To implement this directive, modest funding for ambient water quality monitoring was allocated to the SWRCB and RWQCBs beginning in State Fiscal Year 2000-2001.

AB 982 also required the SWRCB to prepare a proposal for a comprehensive surface water quality monitoring program. That proposal, entitled *Proposal for a Comprehensive Ambient Surface Water Quality Monitoring Program*, was transmitted to the State Legislature on November 30, 2000. At this writing, sufficient funding has <u>not</u> been appropriated to fully implement that plan.

Using the available funding, the SWRCB has created the Surface Water Ambient Monitoring Program (SWAMP). The SWAMP is intended (to the extent that funding is available) to provide measures of the State's ambient water quality and the effectiveness of the State's water quality protection programs.

The SWAMP program relies primarily on contractors to collect information on the quality of the State's waters. Limited RWQCB staff time is spent largely on programmatic (i.e., planning, contracting, reporting) issues; little staff time is available for sample collection or detailed data analyses.

Goals and objectives

The goals and objectives of this year's SWAMP monitoring by the Lahontan Region are twofold: The first objective is to determine—to the extent that funding is available and using a region-wide network of sampling stations—whether ambient water quality at the monitored sites is in compliance with the chemical and physical water quality objectives contained in the *Water Quality Control Plan for the Lahontan Region* ("Basin Plan"). The second objective is to continue an effort begun in 1999 to establish indices of biological integrity (IBIs) for streams in the eastern Sierra Nevada based on instream benthic macroinvertebrate and algae assemblages.

What this data will be used for

The data will be available and utilized for the entire suite of the RWQCB's regulatory and restoration efforts. For example, the data will be used to assess water bodies for compliance with relevant standards; to evaluate the effectiveness of permit conditions, watershed management programs, and nonpoint source programs; and to assist in developing remedial strategies when necessary.

Water bodies to be monitored and type of habitat they represent

Monitoring of chemical and physical parameters will occur at stations located throughout the Region. These stations represent the wide range of habitats found throughout the Lahontan Region, including subalpine, montane, mixed conifer forest, high desert, and low-elevation desert. Bioassessment monitoring will focus on the eastern Sierra Nevada, from the Truckee River watershed in the north, to the Owens River watershed in the south, including primarily montane and mixed conifer forested habitat types. A preliminary list of water bodies to be sampled during FY 03-04 is found in Attachment #1 ("Beneficial Uses and Monitoring Objectives"). Further information regarding the specific analytes and parameters to be sampled/measured is included in Attachment #2 ("USGS Surface Water Monitoring").

Description of watersheds & water bodies

Background

The Lahontan Region is the second largest region in California. (Only the Central Valley Region is larger.) The Lahontan Region spans eastern California from the Oregon border in the north to the Mojave Desert in the south. The Region is nearly 600 miles long and has a total area of more than 33,000 square miles. It includes the highest point (Mount Whitney, +14,494 ft.) and lowest point (Badwater, Death Valley, –282 ft.) in the contiguous United States, more than 3,000 miles of streams, and more than 700 lakes.

The economy of the Region is based largely on recreation and tourism; other major economic sectors include agriculture (i.e., livestock grazing, silviculture), resource extraction (i.e., mining, energy production), and defense-related activities.

Due to the size of the Region, its north-to-south extent of nearly 600 miles, and the variety of elevations, the Lahontan Region contains diverse habitats, ranging from alpine mountain environments that receive heavy snowpack each year, to low-elevation, dry deserts. There is also a great range of habitats, precipitation regimes, and ecosystem types in between these two extremes.

Because of its size and diversity, the limited funding under SWAMP, and because the Lahontan RWQCB has adopted discrete numeric water quality objectives that apply to specific locations throughout the Region (as identified in the Basin Plan), the Lahontan Region has elected <u>not</u> to employ the probabilistic or "rotating basin" approaches being utilized by some other (smaller) RWQCBs. The Lahontan Region has instead implemented a monitoring strategy similar to the other large regions in California (e.g., the Central Valley and North Coast regions) by using its limited SWAMP funding to establish a core network of long-term water monitoring stations throughout the Region. The Lahontan Region's water monitoring stations have been established primarily at locations where discrete numeric water quality objectives have been adopted, and where little or no monitoring has occurred in recent decades. This approach will allow the Lahontan Region to make more rapid and definitive assessments of the extent to which the sampled waters are meeting standards, because sampling results can be directly compared to relevant standards. Staff at the Lahontan Region recognizes that a probabilistic and/or rotating basin sampling approach could provide a more robust estimate of the percentage of water bodies that meet (vs. violate) standards, but such approaches would require substantially more funding and staff resources.

Although the water column monitoring stations are dispersed broadly throughout the Lahontan Region, the Region is focusing its bioassessment efforts on a more limited area. ("Bioassessment" is defined as an assessment of the biological integrity of water bodies based on direct sampling of the assemblages of instream flora and/or fauna.) The Region's bioassessment monitoring is currently focused within six major watershed basins in the center of the Region (e.g., Truckee River, Lake Tahoe, Carson River, Walker River, Mono Basin, Upper Owens River). This central portion of the Region contains special resources, such as two designated Outstanding National Resource Waters (i.e., Lake Tahoe, Mono Lake), and key habitat for threatened aquatic species (i.e., Lahontan cutthroat trout, Paiute cutthroat trout, Yosemite toad, mountain yellow-legged frog, and others). This area also has numerous water bodies that are listed as having impaired water quality. The reason for focusing bioassessment monitoring on this area is to develop biological "reference conditions" for streams in the eastern Sierra. Establishment of reference conditions is a necessary first step toward developing indices of biological integrity (IBIs) that can be used to assess the current degree of support for aquatic life uses, and as a regulatory mechanism (e.g., "biocriteria," permit conditions, numeric targets for TMDLs, etc.) to ensure healthy stream ecosystems.

Beneficial uses, monitoring objectives, and indicators

The SWRCB's November 30, 2000, *Report to the Legislature* contains a comprehensive suite of potential monitoring objectives for the SWAMP. The objectives and associated beneficial uses of water for each sample location within the Lahontan Region are found in Attachment #1 ("Beneficial Uses and Monitoring Objectives").

A variety of water quality indicators will be used, as listed in Attachment #1. A tentative list of specific chemical analytes and physical parameters to be measured at each surface water sampling station are listed in Attachment #2 ("USGS Surface Water

Monitoring”). Additional water quality indictors will be used for bioassessment studies. The bioassessment indicators being explored for use by the Lahontan Region are benthic macroinvertebrates, periphyton, and chlorophyll-a.

General watershed information

For purposes of watershed management, the Lahontan Region is divided into six geographic areas or Watershed Management Areas (WMAs). These WMAs are:

- **Northern WMA** (includes the following Hydrologic Units [HUs]: Cowhead Lake, Surprise Valley, Bare Creek, Cedarville, Fort Bidwell, Duck Flat, Smoke Creek, Madeline Plains, Susanville, Little Truckee River, Truckee River)
- **Lake Tahoe Basin WMA** (includes Lake Tahoe HU)
- **Carson/Walker WMA** (includes the following HUs: West Fork Carson River, East Fork Carson River, West Walker River, East Walker River)
- **Mono/Owens WMA** (includes the following HUs: Mono, Adobe, Owens, Fish Lake, Deep Springs, Eureka, Saline, Race Track, Amargosa, Pahrump)
- **Mojave WMA** (includes the following HUs: Mojave, Broadwell)
- **Antelope Valley/Other Southern Watersheds** (includes the following HUs: Mesquite, Ivanpah, Owlshead, Leach, Granite, Bicycle, Goldstone, Coyote, Superior, Ballarat, Trona, Coso, Upper Cactus, Indian Wells, Fremont, Antelope, Cuddeback)

<u>Northern Watersheds Management Area</u>. In the Surprise Valley (Modoc County) and Susan River (Lassen County) watersheds, there are likely some impacts from livestock grazing and limited agriculture (alfalfa, some row crops). In the Susanville area of Lassen County, additional nonpoint source impacts are from urban runoff, construction-related impacts from land development, roads, timber harvest, use of herbicides for silviculture and weed control, and septic systems. Impacts to wetlands and riparian areas from fill or channelization is also a concern.

In the Truckee River watershed (Nevada County), nonpoint source impacts are from timber harvests, livestock grazing, ski areas and other recreation, transportation corridors (railways and roads), urban runoff and construction-related impacts from rapid land development. Sediment resulting from hydromodification activities, such as reservoir management, is also a concern, as are impacts to wetlands and riparian areas from fill or channelization.

<u>Lake Tahoe Watershed Management Area</u>. In the Lake Tahoe basin (El Dorado and Placer counties), nonpoint source impacts are from ski areas and other recreation, timber harvests, livestock grazing, roads, urban runoff and construction-related impacts from land development. Sediment from shoreline erosion from operation of Lake Tahoe as a reservoir, is also a concern. Also of concern are impacts to wetlands and riparian areas from fill or channelization.

<u>Carson-Walker Watersheds Management Area</u>. In the Carson River watershed (Alpine County), nonpoint source impacts are from recreation, timber harvests, livestock grazing, roads, use of herbicides for weed control, and numerous abandoned mines. Also of concern are impacts to wetlands and riparian areas from fill or channelization.

In the Walker River watershed (Mono County), nonpoint source impacts are from recreation, timber harvests, livestock grazing, roads, use of herbicides for weed control, septic systems, and abandoned mines. Also of concern are impacts to wetlands and riparian areas from fill or channelization, as well as impacts from operation of the Bridgeport Reservoir.

Mono-Owens Watersheds Management Area. In the Mono basin (Mono County), nonpoint source impacts are mainly from livestock grazing, roads, and hydromodification due to water exports. There are some concerns from operation of Grant Lake as a reservoir, impacts from small hydroelectric plants, recreation including the ski area at June Mountain, and urban runoff. Also of concern are impacts to wetlands and riparian areas from fill or channelization.

In the upper Owens River watershed (Mono County), nonpoint source impacts are from recreation, livestock grazing, roads, and hydromodification due to water exports and reservoir management. Also of concern are impacts to wetlands and riparian areas from fill or channelization. In the Town of Mammoth Lakes, additional concerns are from urban runoff and construction-related impacts from rapid land development.

In the lower Owens River watershed (Inyo County), nonpoint source impacts are from recreation, livestock grazing, roads, septic systems, and hydromodification due to water exports and reservoir management. Also of concern are impacts to wetlands and riparian areas from fill or channelization. In the City of Bishop, additional concerns are from urban runoff and construction-related impacts from land development.

Mojave Watershed Management Area. In the Mojave River watershed (San Bernardino County), nonpoint source issues relating to overdraft of the ground water are of concern, including impacts to wetlands and springs. Confined animal facility impacts (as from dairies and chicken farms) are of concern, as are impacts from other agricultural activities. The area is generally in transition from predominately agricultural to urban. Thus, the nonpoint source concerns are shifting towards urban runoff and construction-related impacts from land development. Other concerns include efforts to eradicate invasion of exotic plants and animals, as well as flood control projects.

Antelope Valley/Other Southern Watersheds Management Area. In these watersheds, land development issues (urban runoff, septic systems) contribute to nonpoint source pollution. One confined animal facility is of concern. Historic agricultural use was mainly alfalfa; more common current crops are row crops such as carrots. Pesticide management and irrigation return water management are nonpoint source concerns. Ground water percolation and ground water overdraft are also issues. Some timber harvest occurs. Two small ski areas are proposed for expansion; snowmaking could become an issue. Erosion and habitat loss from deforestation following wildfires is also of concern.

General study design

Overview of general approach

Water sampling. The Lahontan Region is using an approach of investigator pre-selected sites. This approach is termed “directed” sampling. Sample locations for both water sampling and bioassessment are selected based on accessibility (i.e., public access must be available). While a probability-based (i.e., random) site-selection approach would provide a more robust estimate of the extent to which water bodies in the region attain (or violate) water quality standards, such probabilistic sampling would be far more expensive, and is not feasible within current budget constraints. Probabilistic sampling is more expensive for two key reasons: First, randomly selected sites would occur across the landscape, including on private lands. Considerable staff time would be needed to locate access and to obtain permission to sample on private lands, while most sites sampled under the "directed" approach will have easy (i.e., public) access. Second, a probabilistic approach would require substantially more staff time for data analysis, which is not currently available.

Water sampling stations have been established throughout the Lahontan Region, including at least one station within most major hydrologic units. At each water sampling station, data on chemical and physical water quality is collected. Sampling will be conducted quarterly at most stations, except for lakes and desert springs, where samples will generally be collected twice per year. (Lakes are most appropriately sampled during "turnover," when the water column is mixed, which generally occurs during the spring and fall seasons. And the chemistry of most desert springs changes little over the course of a year, so it is more cost-effective to sample less often for a larger suite of analytes than to sample more often for fewer analytes.)

The analytes/parameters measured at each water sampling station generally include those chemical and physical analytes/parameters for which region-wide or site-specific standards have been adopted to protect beneficial uses of water, as found in the Basin Plan. Because the modest funding available under SWAMP is not sufficient to conduct exhaustive sampling or data analysis, the list of analytes is tailored to each site in order to streamline the analysis process. That is, an unique list of analytes has been selected for each site so that the data can be directly compared to the applicable water quality objectives adopted for that site.

<u>Bioassessment</u>. The current focus of the Region's bioassessment sampling is to establish "reference conditions" for streams in the eastern Sierra Nevada. Sampling is conducted at investigator-selected sites that are believed to be minimally-impaired. Selected sites are sampled synoptically for benthic macroinvertebrates, periphyton (i.e., attached algae & diatoms), and selected water chemistry parameters.

How data will be analyzed

The chemical and physical data gathered at water sampling stations will be directly compared to the objectives contained in the Basin Plan to assess compliance with water quality standards. Bioassessment data will be analyzed to yield conclusions on taxonomic composition (e.g., density, diversity, biotic index, presence or absence of indicator taxa, dominance of functional groups), in order to facilitate the development of "reference conditions." An index of biological integrity (IBI) for streams in the eastern Sierra is under development and scheduled for completion by the Spring of 2005.

Specific study design & activities planned

Number of stations

During FY 03-04, the USGS will conduct water and sediment sampling at approximately twenty (20) stations located throughout the Lahontan Region, as detailed in Attachment #2 ("USGS Surface Water Sampling"), and UC-SNARL will conduct bioassessment sampling at eight (8) stations located throughout the eastern Sierra. (The small number of stations sampled for bioassessment during FY 03-04 is due to the fact that the contractor will focus during the current fiscal year on analysis of previously collected data in order to develop an IBI.)

Types and numbers of samples

Surface water sampling by U.S. Geological Survey (USGS). The Lahontan Region will contract with the USGS to conduct surface water sampling at selected sites. Sampling will generally be conducted four (4) times per year at each site, following standard USGS protocols for sample collection, handling, processing, preservation, and analysis. A tentative list of sites and analytes is included in Attachment #2 ("USGS Surface Water Monitoring"). That attachment includes sites to be sampled between Summer 2003 and Spring 2004, using FY 02-03 SWAMP funds. Sampling using FY 03-04 funds will begin during the summer of 2004, when the FY 02-03 funds have been exhausted. Sample locations and analytes for the FY 03-04 funds have not been finalized.

Bioassessment. Using FY 03-04 SWAMP funds, the Lahontan RWQCB will execute a contract with the University of California, Sierra Nevada Aquatic Research Lab (UC-SNARL) to perform bioassessment sampling, manage bioassessment data, and refine the eastern Sierra IBI.

Bioassessment sampling to be conducted during FY 03-04 will include eight (8) sites using FY 01-02 SWAMP funds (contract #01-119-160-0). Bioassessment sampling to be conducted using FY 02-03 and 03-04 funds will begin during the summer of 2004. (This "staggered" approach is necessary because the index period for bioassessment sampling in the Lahontan Region is mid-June through mid-September, and it is not possible to execute contracts in time for sampling to occur using the current FY's funds.) The number and location of sites to be sampled using FY 03-04 funds, and the specific method(s) have not been finalized. This is because the SWAMP bioassessment committee is actively discussing alternative approaches to bioassessment sampling.

The Lahontan Region has executed a contract with UC-SNARL (#9-191-160-0), using funding sources other than SWAMP, to evaluate three common methods for collecting bioassessment information. The results of that study are being analyzed to inform the decision regarding the methods by which bioassessment samples will be collected in the future. Pending the outcome of ongoing deliberations of the SWAMP bioassessment committee, and based upon the results of that "methods comparison" study, bioassessment data collection will follow the protocols specified in the above-referenced contracts, and detailed at: http://www.swrcb.ca.gov/rwqcb6/files/QAPP/QAPP.htm.

Bioassessment data will be analyzed to yield conclusions on taxonomic composition (e.g., density, diversity, biotic index, presence or absence of indicator taxa, dominance of functional groups), in order to facilitate the development of “reference conditions” and indices of biological integrity for eastern Sierra streams.

Notes: A preliminary list of water bodies to be sampled during FY 03-04 is found in Attachment #1 (“Beneficial Uses and Monitoring Objectives”). Further information regarding specific analytes to be sampled and measured is included in Attachment #2 (“USGS Surface Water Monitoring”). All of the USGS and bioassessment sampling to occur during FY 03-04 is being funded using SWAMP funds from FYs 01-02 and 02-03. This is due to the time lag in executing contracts, as discussed above. Bioassessment sampling and analyses (by UC-SNARL) and water sampling (by USGS) utilizing FY 03-04 funds will begin during spring or summer of 2004. Therefore, the water bodies to be sampled by USGS and UC-SNARL using FY 03-04 funds have not been determined.

How stations will be designated

All sample locations will be designated by recording digital coordinates with a hand-held global positioning system (GPS) device. The latitude/longitude or Universal Transverse Mercator (UTM) coordinates will be recorded at each sampling location.

Quality assurance procedures

Quality assurance and quality control (QA/QC) procedures will be specified in a Quality Assurance Project Plan (QAPP) that is currently being developed for the state-wide SWAMP program by contractors working for the SWRCB. Once that state-wide QAPP is completed, all procedures in the QAPP will be followed by the Lahontan Region. In the interim (i.e., until the SWAMP QAPP is completed and approved by SWRCB staff), quality assurance procedures developed by each contractor (e.g., USGS, UC-SNARL) will be followed.

The U.S. Geological Survey (USGS) will follow all quality assurance procedures as documented in its “National Field Manual for the Collection of Water Quality Data” (USGS, TWRI Book 9).

Bioassessment and physical habitat data collection by UC-SNARL will follow the protocols and quality assurance procedures detailed in a QAPP prepared specifically for bioassessment, located at: http://www.swrcb.ca.gov/rwqcb6/files/QAPP/QAPP.htm.

Intra-agency Coordination Activities

The Lahontan RWQCB’s SWAMP staff holds routine conversations to coordinate monitoring conducted by its SWAMP program, TMDL program, and grant-funded projects. SWAMP staff will also coordinate with any monitoring conducted via waivers issued by the RWQCB, and make every reasonable effort to avoid unnecessary duplication.

For example, a grant-funded (CWA 319) project on the West Walker River paid for bioassessment sampling at sites where grazing BMPs were implemented, and SWAMP paid for bioassessment sampling at nearby reference sites, both to facilitate the evaluation of the project and the development of regional reference conditions.

Inter-agency Coordination Activities

The Lahontan RWQCB SWAMP staff has queried all RWQCB staff to learn about other monitoring efforts throughout the Region. And SWAMP staff has expended considerable effort to ensure that duplication is not occurring, and also to coordinate with others who are conducting monitoring in the Region.

For example, SWAMP staff coordinated with the U.S. Forest Service (USFS) during the Bagley Valley Watershed Restoration Project, where the USFS paid for bioassessment monitoring at the treated sites, and SWAMP paid for bioassessment monitoring at nearby reference sites, both to facilitate the evaluation of the project and the development of regional reference conditions.

SWAMP staff has also coordinated similar efforts with the National Park Service (Death Valley National Park), the Bureau of Land Management (Amargosa River), USFS Lake Tahoe Basin Management Unit (Heavenly Valley Creek).

Description of deliverable products

The USGS and UC-SNARL will be required to provide the following deliverables to the Lahontan RWQCB: (1) quarterly progress reports; and (2) final reports that include the data collected under the contracts described above. Any other contract analytical lab(s) will be required to provide the following: (1) analytical data for water samples, and (2) QA/QC data and results. Copies of the final USGS and UC-SNARL reports will also be provided to the State Water Resources Control Board by the Lahontan RWQCB.

Anticipated Milestones

Due to the lag time in executing contracts to encumber funds that became available during the first year of SWAMP (i.e., FY 00-01), actual sampling under the SWAMP program did not begin until Summer 2001. Therefore, the first two years of data have just become available. Staff will strive to prepare an interpretive report by the end of 2004 that summarizes the findings of the first two years of SWAMP data. A tentative schedule of sampling and reporting is as follows:

FY 03-04:

- Water sampling by USGS using FY 02-03 funds
- Bioassessment sampling by UC-SNARL using FY 01-02 and FY 02-03 funds
- Receive all data from USGS for FYs 00-01 and 01-02

FY 04-05:

- Water sampling by USGS using FY 03-04 funds
- Bioassessment sampling by UC-SNARL using FY 02-03 and FY 03-04 funds
- Synoptic water sampling by RWQCB staff using FY 04-05 funds
- Produce interpretive report on first two years of USGS data (by 12/31/04)*

(Note: * = subject to adequate funding & timely execution of contracts)

Budget

The total amount available to the Lahontan Region for SWAMP contracts during FY 03-04 is $379,950. That amount will be distributed among four (4) contracts as depicted in the following table:

Contract Purpose	Contractor	Amount
Surface water sampling	U.S. Geological Survey	$138,000
Bioassessment	U.C. Santa Barbara (SNARL)	$175,000
Student Assistants	Community College Foundation	$30,000
Data Management & Analyses	Moss Landing Marine Lab	$7,000
	TOTAL	**$379,950**

As discussed in the Specific Study Design (above), a variety of bioassessment methods may be used, depending on the outcome of the "methods comparison study" that is currently underway. The level of effort and cost per sample for bioassessment will vary depending on travel time, collection/analysis method used, number of organisms in the sample, and whether (and what type of) associated physical habitat data is collected.

At this time, the Lahontan RWQCB does not expect to receive significant budget allocation(s) for FY 03-04 under any other monitoring programs (e.g., Toxic Substances Monitoring Program, Mussel Watch, etc.).

Working Relationships

The following decision matrix illustrates the general relationships for implementing SWAMP.

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
Develop contract(s) for monitoring services.	●	●	●

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
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, & assessment of available info, 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.	●	● (Coordination Role)	●
Prepare written report of data.	●		●

Attachment #1, Lahontan Region SWAMP Workplan (FY 03-04)

Beneficial Uses & Monitoring Objectives (p. 1 of 3)					
Station Name Hydro Unit #	**Beneficial Use(s)**	**Monitoring Objective(s)** [(1)]	**Frequency**	**Category**	**Indicator(s)** [(2)]
Mill Creek at Upper Lake (near Lake City) 641.30	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Bidwell Creek 641.30	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Cedar Creek (near Cedarville) 641.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Susan River above confluence w/ Willard Cr 637.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Susan River near Litchfield 637.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
West Fork Carson River at Hope Valley 633.00	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
East Frk Carson River below Markleeville 632.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
West Walker River at Coleville 631.10	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
East Walker River at CA/NV state line 630.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Mammoth Creek at Twin Lakes 603.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment

Notes: 1. Monitoring Objectives: From 11/30/00 Report to the Legislature, Section VI (attached)
2. Indicator: From 11/30/00 Report to the Legislature, Section VII, Table 3, Pages 33-35

Beneficial Uses & Monitoring Objectives (p. 2 of 3)					
Station Name Hydro Unit #	**Beneficial Use(s)**	**Monitoring Objective(s) (1)**	**Frequency**	**Category**	**Indicator(s) (2)**
Mammoth Creek at Old Mammoth Road 603.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	One time only	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Mammoth Creek at Hwy 395 603.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Mammoth Creek tributary 603.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Twin Lakes 603.10	MUN, AGR, REC-2, COLD, WILD, RARE	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Hilton Creek at Hwy 395 603.10	MUN, AGR, REC-2, COLD, WILD,	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Rock Creek above diversion 603.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients, Sediment
Amargosa River 609.00	MUN, REC-1, REC-2	2, 9, 20	One time only	Contaminant Exposure, Pollutant Exposure	Fecal coliform bacteria, Inorganic Water Chemistry, Nutrients
Mojave River at Upper Narrows 628.20	MUN, AGR, REC-2, WARM, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Organic Water Chemistry, Nutrients
Mojave River at Forks Dam 628.20	MUN, AGR, REC-2, WARM, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Organic Water Chemistry, Nutrients
Deep Creek above Deep Creek Lake 628.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients
Holcomb Creek at Crabflats Road 628.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients

Notes: 1. Monitoring Objectives: From 11/30/00 Report to the Legislature, Section VI (attached)
2. Indicator: From 11/30/00 Report to the Legislature, Section VII, Table 3, Pages 33-35

Beneficial Uses & Monitoring Objectives (p. 3 of 3)					
Station Name Hydro Unit #	**Beneficial Use(s)**	**Monitoring Objective(s)** **(1)**	**Frequency**	**Category**	**Indicator(s)** **(2)**
Crab Creek at Crab Creek Road 628.20	MUN, AGR, REC-2, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients
Sheep Creek below Lake Arrowhead Scout Camp 628.20	MUN, AGR, REC-2, WARM, COLD, WILD	2,9,16,20	Quarterly	Contaminant Exposure, Pollutant Exposure	Inorganic Water Chemistry, Nutrients
Sites (to be determined) for bioassessment sampling	COLD, WILD, RARE	9	Once	Biological Response	Macroinvertebrate assemblage, Periphyton, assemblage, Chlorophyll-a

Notes: 1. Monitoring Objectives: From 11/30/00 Report to the Legislature, Section VI (attached)
2. Indicator: From 11/30/00 Report to the Legislature, Section VII, Table 3, Pages 33-35

Excerpts from 11/30/00 Report to Legislature:

SECTION VI. SITE-SPECIFIC MONITORING

The overall goal of this activity of SWAMP is to develop site-specific information on sites that are (1) known or suspected to have water quality problems and (2) known or suspected to be clean. It is intended that this portion of SWAMP will be targeted at specific locations in each region. This portion of SWAMP is focused on collecting information from sites in water bodies of the State that could be potentially listed or delisted under CWA Section 303(d). The RWQCBs are given significant flexibility to select the specific locations to be monitored. The RWQCBs at their discretion may perform monitoring at clean sites to determine baseline conditions (for assessments related to antidegradation requirements) or if this information is needed to place problem sites into perspective with cleaner sites in the Region.

Monitoring Objectives

In developing the SWAMP monitoring objectives, the SWRCB used a modified version of the model for developing clear monitoring objectives proposed by Bernstein et al. (1993). The model makes explicit the assumptions and/or expectations that are often embedded in less detailed statements of objectives (as presented in SWRCB, 2000). This section is organized by each major question posed in the SWRCB report to the Legislature on comprehensive monitoring (SWRCB, 2000).

Is it safe to swim?

Beneficial Use: Water Contact Recreation

1. At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pathogenic contaminants, estimate the concentration of bacteria or pathogens above screening values, health standards, or adopted water quality objectives.

Is it safe to drink the water?

Beneficial Use: Municipal and Domestic Water Supply

2. At specific locations in lakes, rivers and streams that are sources of drinking water and suspected to be contaminated, estimate the concentration of microbial and chemical contaminants above screening values, drinking water standards, or adopted water quality objectives used to protect drinking water quality.

3. At specific locations in lakes, rivers and streams that are sources of drinking water and suspected to be contaminated, verify previous estimates of the concentration of microbial and chemical contaminants above screening values, drinking water standards, or adopted water quality objectives used to protect drinking water quality.

Is it safe to eat fish and other aquatic resources?

Beneficial Uses: Commercial and Sport Fishing, Shellfish Harvesting

4. At specific sites influenced by sources of bacterial contaminants, estimate the concentration of bacterial contaminants above health standards or adopted water quality objectives to protect shellfish harvesting areas.

5. At specific sites influenced by sources of chemical contaminants, estimate the concentration of chemical contaminants in edible aquatic life tissues above advisory levels and critical thresholds of potential human health risk.

6. At frequently fished sites, estimate the concentration of chemical contaminants in commonly consumed fish and shellfish target species above advisory levels and critical thresholds of potential human health risk (Adapted from USEPA, 1995).

7. At frequently fished sites, verify previous estimates of the concentration of chemical contaminants in commonly consumed fish and shellfish target species above advisory levels and critical thresholds of potential human health risk (Adapted from USEPA, 1995).

8. Throughout water bodies (streams, rivers, lakes, nearshore waters, enclosed bays and estuaries), estimate the concentration of chemical contaminants in fish and aquatic resources from year to year using several critical threshold values of potential human impact (advisory or action levels).

Are aquatic populations, communities, and habitats protected?

Beneficial Uses: Cold Freshwater Habitat; Estuarine Habitat; Inland Saline Water Habitats; Marine Habitat; Preservation of Biological Habitats; Rare, Threatened or Endangered Species; Warm Freshwater Habitat; Wildlife Habitat

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, nearshore 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, nearshore waters, enclosed bays, or estuaries using several critical threshold values of toxicity, benthic community analysis, habitat condition, and chemical concentration.

11. Identify the areal extent of degraded sediment locations in rivers, lakes, nearshore waters, enclosed bays, and estuaries using several critical threshold values of toxicity, benthic community analysis, habitat condition, and chemical concentration.

Beneficial Use: Spawning, Reproduction and/or Early Development

12. 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 sediment in rivers, lakes, nearshore waters, enclosed bays, and estuaries using several critical threshold values of early life-stage toxicity, chemical concentration, and physical characteristics.

13. At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pollutants, verify previous measurements identifying specific

locations of degraded water or sediment in rivers, lakes, nearshore waters, enclosed bays, and estuaries using several critical threshold values of early life-stage toxicity, chemical concentration, and physical characteristics.

Is water flow sufficient to protect fisheries?

Beneficial Use: Migration of Aquatic Organisms; Rare, Threatened or Endangered Species; Wildlife Habitat

14. At specific sites influenced by pollution, estimate the presence of conditions necessary for the migration and survival of aquatic organisms, such as anadromous fish, using measures of habitat condition including water flow, watercourse geomorphology, sedimentation, temperature, and biological communities.

15. At specific sites influenced by pollution, verify previous estimates of the presence of conditions necessary for the migration and survival of aquatic organisms, such as anadromous fish, using measures of habitat condition including water flow, watercourse geomorphology, sedimentation, temperature, and biological communities.

Is water safe for agricultural use?

Beneficial Use: Agricultural supply

16. At specific locations in lakes, rivers and streams that are used for agricultural purposes, estimate the concentration of chemical pollutants above screening values or adopted water quality objectives used to protect agricultural use.

17. At specific locations in lakes, rivers and streams that are used for agricultural purposes, verify previous estimates of the concentration of chemical pollutants above screening values or adopted water quality objectives used to protect agricultural uses.

Is water safe for industrial use?

Beneficial Use: Industrial Source Supply; Industrial Process Supply

18. At specific locations in coastal waters, enclosed bays, estuaries, lakes, rivers and streams that are used for industrial purposes, estimate the concentration of chemical pollutants above screening values or adopted water quality objectives used to protect industrial use.

19. At specific locations in coastal waters, enclosed bays, estuaries, lakes, rivers and streams that are used for industrial purposes, verify previous estimates of the concentration of chemical pollutants above screening values or adopted water quality objectives used to protect industrial uses.

Are aesthetic conditions of the water protected?

Beneficial Use: Non-Contact Water Recreation

20. At specific locations in coastal waters, enclosed bays, estuaries, lakes, rivers and streams, estimate the aesthetic condition above screening values or adopted water quality objectives used to protect non-contact water recreation.

At specific locations in coastal waters, enclosed bays, estuaries, lakes, rivers and streams, verify previous estimates of the aesthetic condition above screening values or adopted water quality objectives used to protect non-contact water recreation.

Attachment #2
USGS Surface Water Monitoring (Summer 2003 – Spring 2004)

LOCATION	FREQ	Lab Code	ANALYTES	BOTTLE SETS
Bidwell Creek	4 times	 27 2187 1571 1979 HSWL 2333	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus	500TBY 250 FU 125 FCC 125WCA HS LAB
Mill Creek at Upper Lake (near Lake City)	4 times	 27 2187 1571 1975 HSWL 2333	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus	500TBY 250 FU 125 FCC 125WCA HS LAB
Cedar Creek (near Cedarville)	4 times	 27 2187 1571 1975 HSWL 2333	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus	500TBY 250 FU 125 FCC 125WCA HS LAB
Susan River above confluence with Willard Creek	4 times	 27 2187 1571 1975 1986 2333	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus	500TBY 250 FU 125 FCC 125WCA

Susan River near Litchfield	4 times	 27 2187 1571 1979 1986 2333	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus	500TBY 250 FU 125 FCC 125WCA
West Fork Carson River at Hope Valley	4 times	 27 2187 1571 1572 1973 1979 HSWL 2333 2110	Discharge Fecal Coliform suspended sediment (SSC) total suspended solids (TSS) TDS Turbidity Chloride Sulfate nitrite nitrite + nitrate low level TKN total phosphorus low level boron	500TBY 250 FU 125 FCC 125WCA 250 FA HS LAB
East Fork Carson River below Markleeville	4 times	 27 2187 1571 1572 1975 HSWL 2333 2110	Discharge Fecal Coliform suspended sediment (SSC) total suspended solids (TSS) TDS Turbidity Chloride Sulfate nitrite + nitrate TKN total phosphorus low level boron	500TBY 250 FU 125 FCC 125WCA 250 FA HS LAB
West Walker River at Coleville	4 times	 27 2187 1571 1572 1979 HSWL 2333 2110	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride Sulfate nitrite + nitrate low level TKN total phosphorus low level boron	500TBY 250 FU 125 FCC 125WCA 250 FA HS LAB

East Walker River at CA/NV state line	4 times	 27 2187 1571 1979 1986 2333 2110	Discharge Fecal Coliform suspended sediment TDS Turbidity Chloride nitrite + nitrate TKN total phosphorus low level boron	500TBY 250 FU 1125 FCC 125 WCA 250 FA
Mammoth Creek at Twin Lakes	4 times	 27 2187 1571 1973 1979 HSWL 1978 2333 sc1678	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level Dissolved and total metals	250 FU 125 WCA 125 FCC 500 TBY 250 FA 250 RA 250 FAM 250 RAM HS LAB
Mammoth Creek at Old Mammoth Road	4 times	 27 2187 1571 1977 1979 HSWL 1978 2333 sc1678	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level Dissolved and total metals	250 FU 125 WCA 125 FCC 500 TBY 250 FA 250 RA 250 FAM 250 RAM HS LAB
Mammoth Creek at Highway 395	4 times	 27 2187 1571 1977 1979 HSWL 1978 2333 sc1678	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level Dissolved and total metals	250 FU 125 WCA 125 FCC 500 TBY 250 FA 250 RA 250 FAM 250 RAM HS LAB

Mammoth Creek Trib	4 times	 27 2187 1571 1977 1979 HSWL 1978 2333 sc1678	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level Dissolved and total metals	250 FU 125 WCA 125 FCC 500 TBY 250 FA 250 RA 250 FAM 250 RAM HS LAB
Twin Lakes	4 times; 3 sites; 3 depths at each site	 27 2187 1571 1977 1979 HSWL 1978 2333	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level	250 FU 125 WCA 125 FCC 500 TBY 250 FA 250 RA 250 FAM 250 RAM HS LAB
Rock Creek above Diversion	4 times	 27 2187 1571 1977 1979 HSWL 1978 2333	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level	500 TBY 250 FU 125 FCC 125 WCA HS LAB
Hilton Creek at Highway 395	4 times	 27 2187 1571 1977 1979 1986 1978 2333	Discharge suspended sediment TDS Turbidity Chloride Nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level	500 TBY 250 FU 250 FU 125 FCC 125 WCA

Mojave River at Upper Narrows	4 times	 27 1571 1572 1977 1979 1986 1984 sc1307 31 2110	Discharge TDS Chloride Sulfate Nitrite nitrate + nitrite low level TKN total phosphorus VOCs Fluoride Boron	250 FU 250 FA 125 FCC 125 WCA 3-40 ml GVC
Mojave River at Forks Dam	4 times	 27 1571 1572 1977 1979 1986 1984 sc1307 31 2110	Discharge TDS Chloride Sulfate Nitrite nitrite + nitrate TKN total phosphorus VOCs Fluoride Boron	250 FU 250 FA 125 FCC 125 WCA 3-40 ml GVC
Deep Creek above Deep Creek Lake (at town of Arrowbear Lake)	4 times	 27 1986 1977 1979 1978 1984 1572 1571 31 2110	Discharge TDS TKN nitrite nitrite + nitrate low level dissolved ortho-phosphate total phosphorus sulfate chloride fluoride boron	250 FU 250 FA 125 FCC 125 WCA
Holcomb Creek at Crabflats Road	4 times	 27 1986 1977 1979 1978 1984 1572 1571 31 2110	Discharge TDS TKN nitrite nitrite + nitrate low level dissolved ortho-phosphate total phosphorus sulfate chloride fluoride boron	250 FU 250 FA 125 FCC 125 WCA

Crab Creek at Crab Creek Road	4 times	 27 1986 1977 1979 1978 1984 1572 1571 31 2110	Discharge TDS TKN nitrite nitrite + nitrate low level dissolved ortho-phosphate total phosphorus sulfate chloride fluoride boron	250 FU 250 FA 125 FCC 125 WCA
Sheep Creek below Lake Arrowhead Scout Camp	4 times	 27 1986 1977 1979 1978 1984 1572 1571 31 2504	Discharge TDS TKN Nitrite nitrite + nitrate, low level dissolved ortho-phosphate total phosphorus sulfate chloride fluoride, boron, twice (high & low flow); this is low-level analysis for B.	250 FU 250 FA 125 FCC 125 WCA
Amargosa River (three sites)	One time only (March 2004)	 2187 27 sc1678 1977 1979 HSWL 1978 2333 1574 489 1043 2812 2812 2622	Discharge suspended sediment (SSC) turbidity TDS trace metals (total + dissolved) plus major ions (lc2109, 2110, 1571, 31, 54, 56, 675, 1572) nitrite nitrite + nitrate low level TKN dissolved ortho-phosphate total phosphorus low level fecal coliform bacteria deuterium oxygen 18 tritium gross alpha gross beta radium 226	2-250 FA 250 FU 250 RU 125 FCC 125 WCA 100 RUS 1 L RUR 250 FA 1 L RUS 1 L RUS