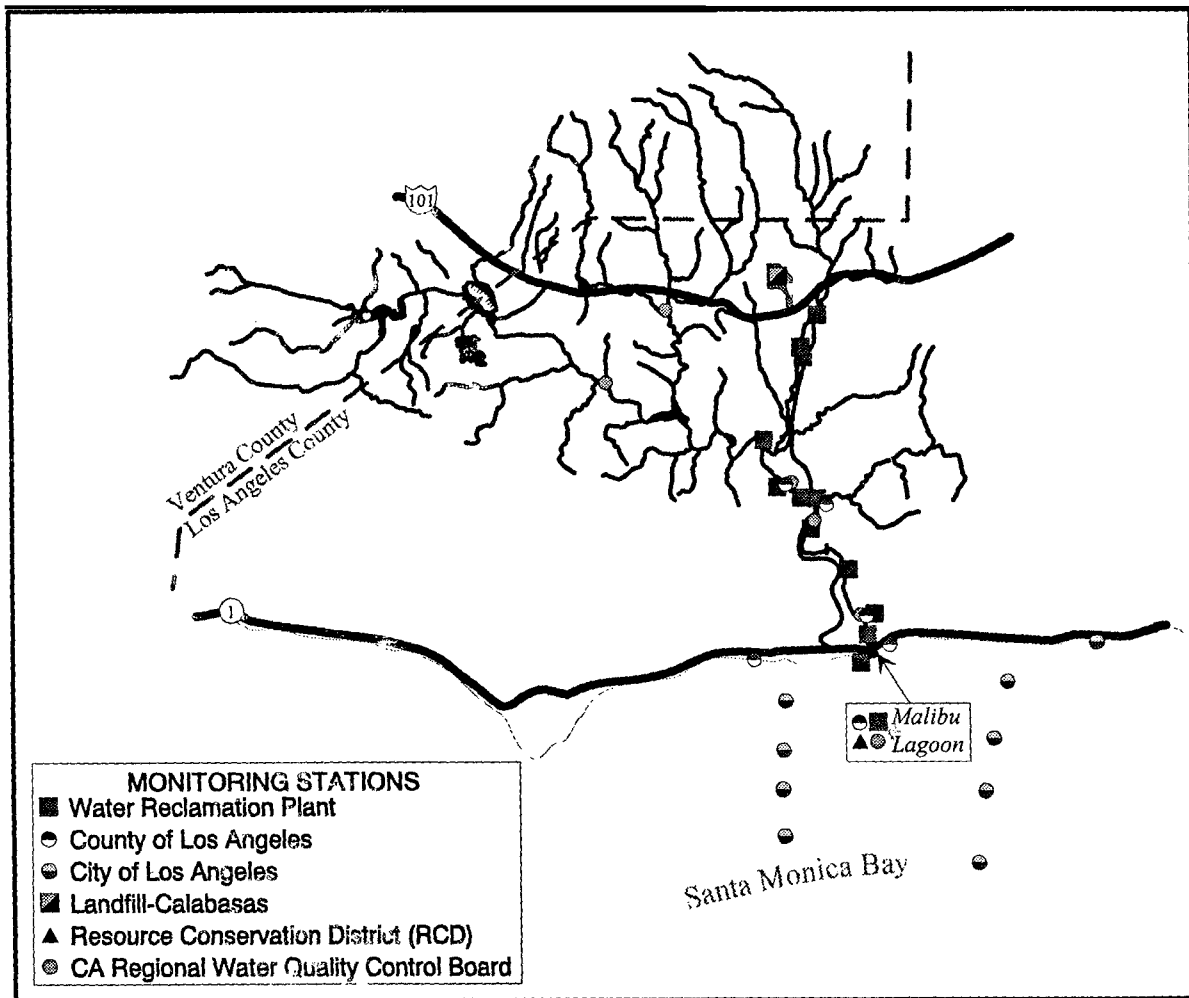


Review of Monitoring and Response Protocol for the Malibu Creek Watershed



Santa Monica Bay Restoration Project
Report prepared by Heather Trim

November, 1994

REVIEW OF MONITORING ACTIVITIES AND RESPONSE PROTOCOL FOR THE MALIBU CREEK WATERSHED

Santa Monica Bay Restoration Project Heather Trim

[Note: The first draft of this report was originally written in late 1992 through early 1993. Many new projects or planning efforts have been initiated since then. New events or updates are, for the most part, highlighted as footnotes.]

ABSTRACT

Public concern about the extent and use of monitoring data led the Santa Monica Bay Restoration Project to undertake this review of monitoring and response protocols in the Malibu Creek watershed. The Malibu Creek watershed is an important contributor of pollutants into the Santa Monica Bay.

A large amount of resources go into regular monitoring of the Malibu Creek watershed: seven agencies conduct ten major monitoring programs of water, sediment, or biological quality. The agencies and programs include:

- Las Virgenes Municipal Water District-Tapia Water Reclamation Facility *(5 self-monitoring programs)*
- Topanga-Las Virgenes Resource Conservation District
- County Sanitation Districts of Los Angeles County-Calabasas Landfill
- Los Angeles County Department of Public Works
- Los Angeles County Department of Health Services
- City of Los Angeles, Department of Public Works, Bureau of Sanitation, Environmental Monitoring Division-Hyperion Sewage Treatment Plant
- Regional Water Quality Control Board
 - Surface Water Monitoring Program*
 - Mussel Watch Program*
 - Toxic Substances Monitoring Program*
 - Compliance Monitoring*

These monitoring programs cost approximately \$1.1 million in 1993. Over 40 surface water and sediment stations and over 70 groundwater wells are sampled regularly. With the exception of the Calabasas landfill, most of the sampling locations are in the lower and middle Malibu Creek area.

Numerous other agencies or groups conduct monitoring programs in the watershed on a regular basis including weed abatement inspections, water level inspections and small scale water quality maintenance. In addition to describing the major regular monitoring programs, this report also contains summaries of special studies and old data collection programs related to the Malibu Creek watershed. Finally, this report discusses recommended improvements for interim monitoring and response protocols for the watershed.

Major ongoing watershed planning/research activities that affect monitoring/response protocols (As of August, 1994)

- Malibu Creek Watershed Interim Council
- Malibu Creek Watershed Natural Resource Plan And Executive and Advisory Committees
- Santa Monica Bay Restoration Project Action Plan
- California Department of Fish and Game Rindge Dam removal project
- City of Malibu Wastewater Management Study
- Regional Water Quality Control Board Water Quality Assessment Report

Findings/recommendations in this study include:

- There are many positive aspects of the monitoring programs conducted in the Malibu Creek watershed. A large amount of money and resources have been committed to the watershed by local and regional agencies. Many of the monitoring programs have flexibility built in to their design so that the programs can be changed to address new problems. In addition, a one year enhanced monitoring program, by the Las Virgenes Municipal Water District, will add needed information about the lower watershed and help lay the foundation for a future more comprehensive monitoring program.
- Many of the monitoring programs are not familiar to members of the Malibu concerned public (i.e., people interviewed in this study) or even to the staff of other agencies that monitor in the watershed. The agencies need to do a better job of publicizing their monitoring programs.
- The Malibu Creek watershed represents approximately one fortieth of the total drainage area within the jurisdiction of the Los Angeles Regional Water Quality Control Board's (most of Los Angeles and Ventura Counties), and yet the watershed receives large amounts (more than 1/40) of the financial expenditures of some regional programs.
- At present, there are no overall goals for monitoring in the Malibu Creek watershed. A watershed-wide technical committee should review all proposed monitoring goals and sampling procedures. A triggering or threshold policy should be developed in coordination with the monitoring goals. If a constituent is found to be above the "action level," then specific, predetermined agency actions should be implemented. Upper watershed cities, now only minimally involved in monitoring, should be more involved in the overall strategic planning.
- Leaders at the different agencies need to be involved in evaluating the current policy goals of the monitoring programs. Some aspects of the programs should be eliminated or cut back, but inertia tends to keep them in place.
- Increased communication is needed between the different monitoring agencies in order to effectively coordinate the overall monitoring effort of the watershed. Data should be made available for exchange.
- There is some duplication in monitoring, both in parameters and in monitoring locations. Malibu Creek at Cross Creek road is monitored by four different agencies. The Regional Water Quality Control Board should consider moving their sampling station from Cross Creek Road to a new station in the upper watershed. The Las Virgenes Municipal Water District should consider reducing sampling at Cross Creek Road and adding a sampling location above the Serra Retreat to use as a comparison location.

- ❏ Some of the gaps in data collection in the lower watershed have been addressed by the enhanced monitoring by Las Virgenes Municipal Water District. Overall, however, the parameter coverage of the entire watershed should be organized to address problems, or potential problems, watershed-wide. Increased monitoring for biodiversity and sediment runoff is needed. Biomonitoring should be added.
- ❏ Ground water in the watershed needs to be studied. The possible interaction of ground water with septic systems near the Malibu Lagoon, and at other areas, and the alleged leakage of chemicals from the Calabasas Landfill, should be considered in future hydrogeologic models.
- ❏ Permits and Requirements issued by the Regional Water Quality Control Board determine much of the monitoring that occurs in the watershed. Many of the NPDES permits and Waste Discharge Requirements in the watershed, and in the region as a whole, either need to be updated (renewed), enforced (some aspects of permits need to be enforced), or rescinded (officially terminated).
- ❏ A consistent weather policy (i.e., sampling during storms) needs to be established by each agency.
- ❏ The public needs easier access to the monitoring data. A centralized clearinghouse that would serve as an index to the locations and types of data would be useful. Each agency should publish an annual (or periodic) report of the data. This would provide researchers, other agencies and concerned members of the public, with accurate and timely accounts of the data and would also provide as much needed positive public relations for the various agencies.
- ❏ Response protocol for crisis situations (spills, etc.) are established, but response protocols for long-term problems are not institutionalized. Many data have been collected, and some people think that it is time to address the problems that the data have revealed.
- ❏ Beach closures are an important response issue in the Santa Monica Bay. In order to better include all interested parties in the information loops, Los Angeles County Department of Health Services should add environmental groups to its Beach Closure Notification List (which currently only includes government agencies).
- ❏ Public activists concerned with the Malibu Creek watershed should, with the assistance of the regulatory and resource agencies, educate themselves about all of the permits in the watershed and about the permit writing and approval process. The public should become involved with those permits which are relevant to their particular concerns (as in the enhanced monitoring program resulting from the environmental groups' agreement with the Las Virgenes Municipal Water District).
- ❏ Surfers, and other members of the public, including hikers and citizen volunteers, are front-line observers of environmental problems in the lower watershed. There should be a formal system for documentation, collection, and reporting of observations by members of the public about health problems, spills or other problems. In addition, a citizens volunteer monitoring program should be initiated. These observations should be accurately and effectively communicated to all concerned in the community.

ACRONYM LIST

BPTCP	Bay Protection and Toxic Cleanup Program (State)
CDPR	California Department of Parks and Recreation
CSCC	California State Coastal Conservancy
CSDLAC	County Sanitation Districts of Los Angeles County
CSWRCB	California State Water Resources Control Board
DHS	Los Angeles county Department of Health Services
LAC	Los Angeles County
LACDPW	Los Angeles County Department of Public Works
LADPW	Los Angeles City Department of Public Works
LA-EMD	Los Angeles City. DPW, Environmental Monitoring Division
LVMWD	Las Virgenes Municipal Water District
NPDES	National Pollutant Elimination System
NPS	National Park Service-Santa Monica Mountains National Recreation Area
RWQCB	Regional Water Quality Control Board (Los Angeles Region)
RWQCB-P	Regional Water Quality Control Board-Planning Unit
RWQCB-MW	Regional Water Quality Control Board-Mussel Watch Program
RWQCB-TSM	Regional Water Quality Control Board-Toxic Substances Monitoring Program
SMBRP	Santa Monica Bay Restoration Project
SCAG	Southern California Association of Governments
USDA-SCS	United States Soil Conservation Service
TLVRCD	Topanga-Las Virgenes Resource Conservation District
TWRF	Tapia Water Reclamation Facility
USEPA	United States Environmental Protection Agency
VCPWA	Ventura County Public Works Agency

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INTRODUCTION

Purpose of this study

In recent years, persons knowledgeable about the condition of Malibu Lagoon and the human health safety of Surfrider Beach in Malibu have raised concerns over the management of water quality monitoring in the Malibu Creek Watershed. In addition, a recent survey of Malibu residents by the City of Malibu General Plan Task Force showed that water pollution ranks as the community's number one concern (The Outlook, 1992). In response to these concerns, and as part of their overall consideration of monitoring in the Santa Monica Bay, the Santa Monica Bay Restoration Project has resolved to improve communication with the public about the results of water quality monitoring and to "develop a protocol to ensure timely reporting and sharing of study results of indicators, pathogens and other potential health hazards" (SMBRP, 1992b).

As part of their efforts to improve communication regarding monitoring and public health issues in the watershed, the Santa Monica Bay Restoration Project obtained a grant from Environment Now to conduct this review of the monitoring activities and response protocols in the Malibu Creek Watershed. This report will discuss recommended improvements for interim monitoring and response protocols for the watershed.

Description of Malibu Creek Watershed

The total natural drainage of Santa Monica Bay watershed is 328 square miles. Of that total drainage, the Malibu Creek sub-watershed drains an area of approximately 109 square miles in the Santa Monica Mountains and the Simi Hills (Figure 1, Figure 2). About two-thirds of the Malibu Creek watershed lies in Los Angeles County and one-third in Ventura County. Cities in the watershed include parts of Malibu, Calabasas, Agoura Hills, Westlake Village, Hidden Hills, and Thousand Oaks (USDA-SCS, 1992).

Malibu Creek flows through a steep-sided canyon and, in the upper Santa Monica Mountains, has a mushroom shaped tributary system which is controlled by geologically young, uplifted valleys bounded by east-west trending reverse faults. Historically, there is little flow in the summer months, much of the natural flow that *does* occur in the summer in the upper tributaries comes from springs and seepage areas (figure 3). The springs and seepages primarily originate in the Lower Topanga Formation which is dominated by coarse grained sandstone and conglomerate. The major springs are in the upper Cold Creek, La Sierra Canyon and an unnamed tributary south of Century Reservoir. Seepage areas occur in porous stream alluvium and frequently form ponds or flowing surface water (Flowers, 1972). Although the watershed flow is low during the dry season, it is important to note that the overall annual water volume is large, as is typical of southern Californian creeks. Over 70% of the annual runoff occurs during winter storms (SCAG, 1988). Imported water discharged by point sources or contributed by nonpoint sources have altered the natural hydrology of the watershed.

Significance of Malibu Creek Watershed

In a recent study of pollutant loading into Santa Monica Bay, Ballona Creek (ranked #1) and Malibu Creek (ranked #2) were found to be the two largest drainage basins contributing contaminants to the Bay. They only rank 8th and 18th, respectively, in pollutant *concentration* but are large overall contributors because of their high volumes of annual water flow. The average annual storm runoff from the Malibu Creek watershed is calculated at 13,565 acre-feet, as compared to 80,482 acre-feet for the total Bay (SMBRP, 1992f). In wet years, Malibu Creek has a comparable amount of runoff to Ballona Creek, but in dry years the runoff in Ballona Creek is 2 to 10 times greater (SCAG, 1988). The most recent calculations for contaminant loads from the Malibu Creek watershed are based on the following watershed land uses: 88% undeveloped or open land, 4% commercial, light industrial or other urban, and 9% residential (SMBRP, 1992f).

Malibu Canyon and Cold Creek Canyon are designated as "Significant Watersheds" because they are "relatively undisturbed watershed areas containing exceptional undisturbed riparian and oak woodlands"

Figure 1. Watersheds that drain into Santa Monica Bay Malibu Creek watershed is labelled number 12 (from SMBRP, 1992f)

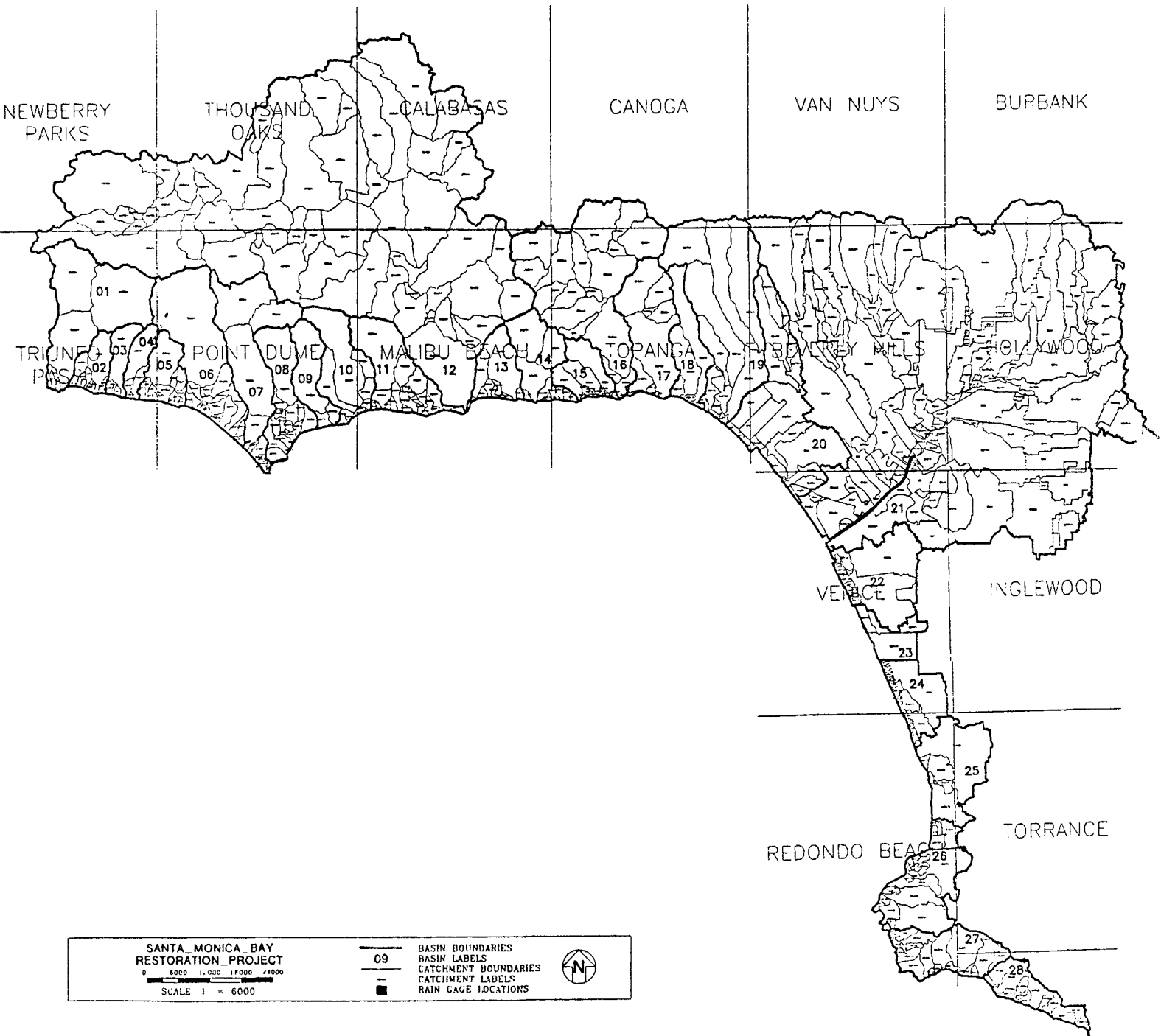


Figure 2. Map of Malibu Creek Watershed showing political boundaries (from USDA-SCS, 1992).

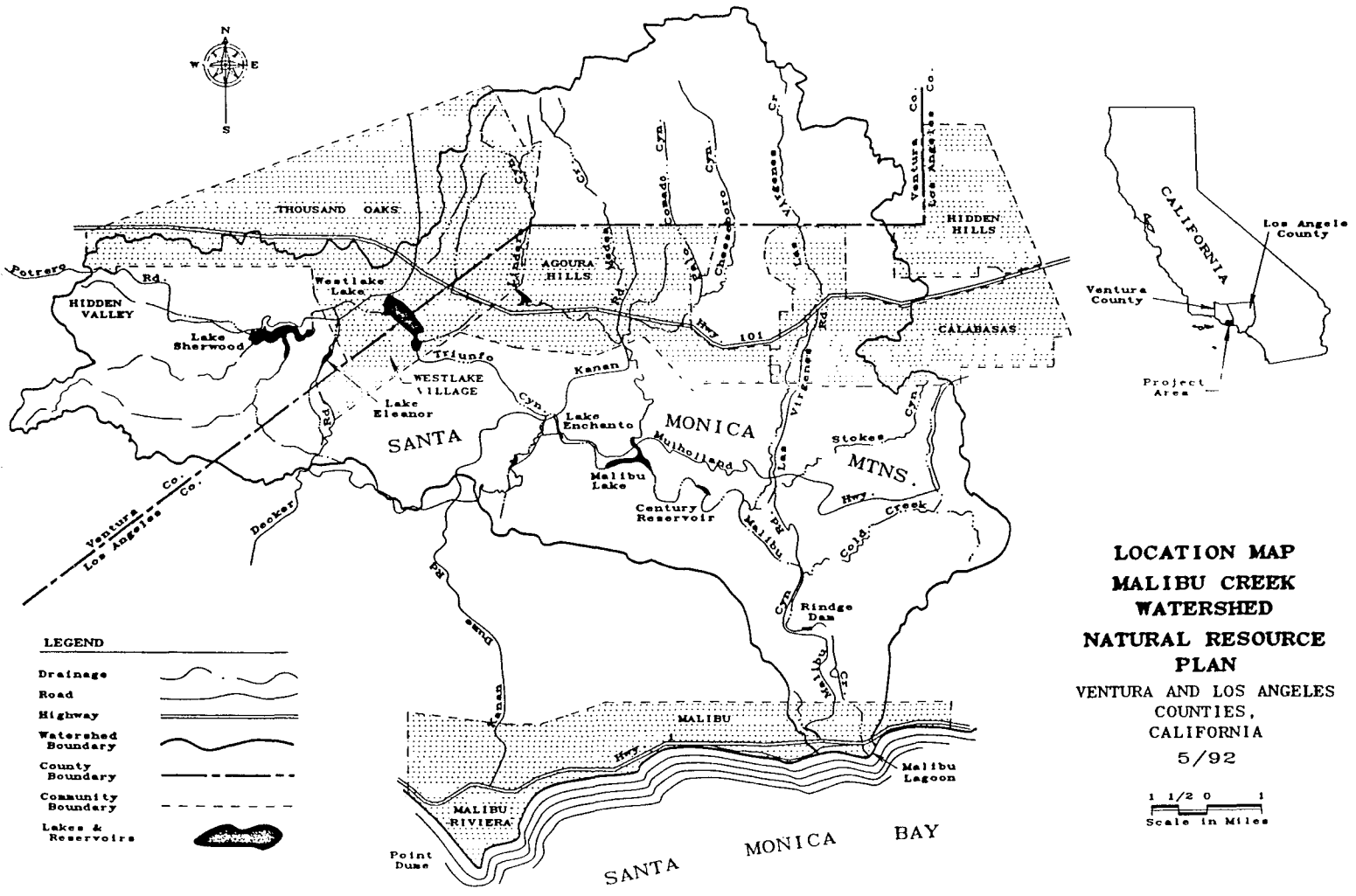
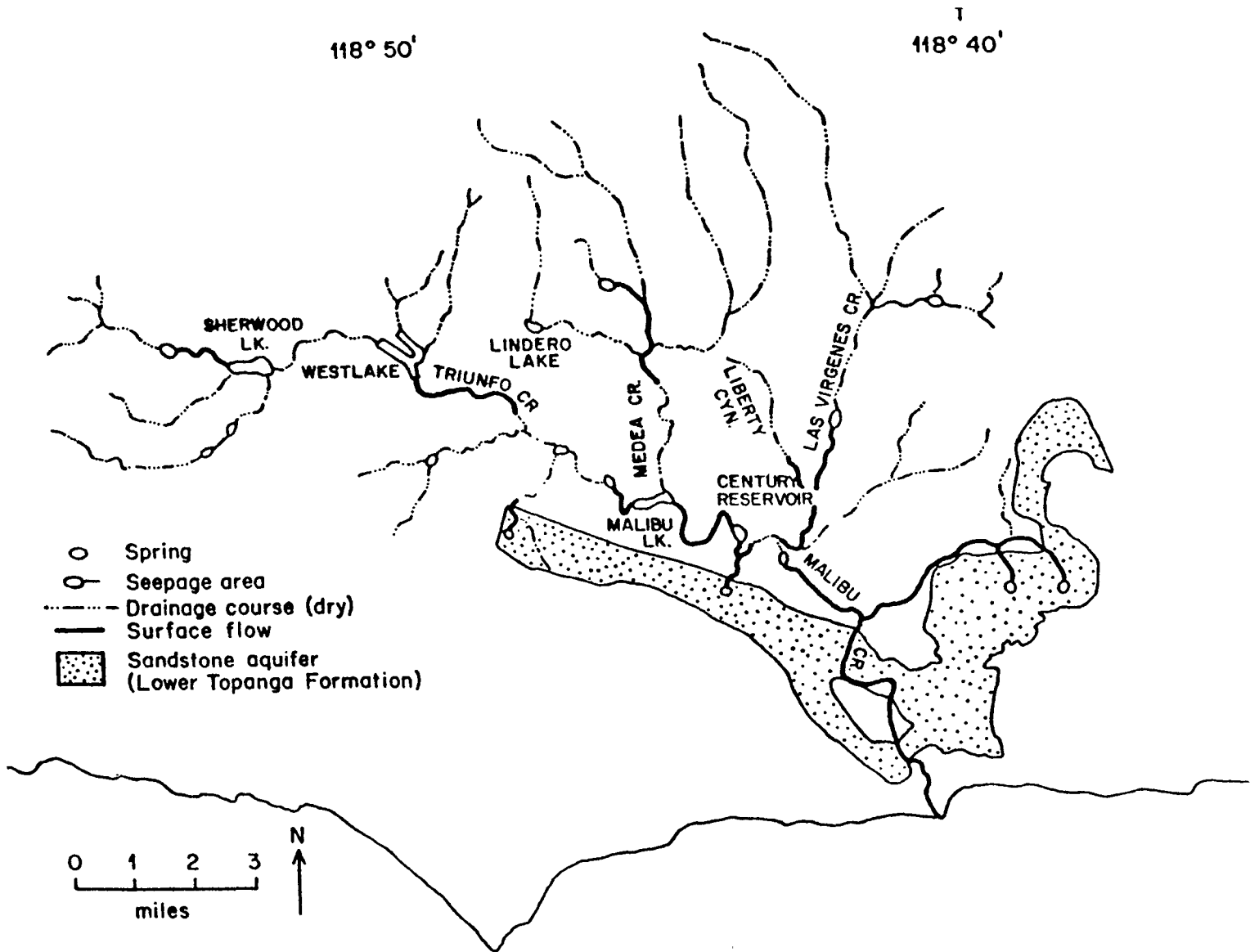


Figure 3. Map showing surface springs and seepage areas in Malibu Creek watershed (from Flowers, 1972).



(LAC, 1986b) Malibu Creek terminates at the Malibu Lagoon, an area of about 13 acres of shallow brackish water, that provides a nursery habitat for certain fish species and a winter stopover for migrating birds (TLVRCD, 1989) The creek and the lagoon are the southernmost steelhead trout run on the west coast (CalTrout, 1990c). Malibu Lagoon is a small surviving remnant of wetland in southern California (Philip Williams et al, 1992).

Beneficial uses¹, as designated by the Regional Water Quality Control Board, of the *surface waters* of the Malibu Creek watershed include: recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, fish migration, fish spawning, municipal and domestic supply, industrial service supply, industrial process supply, agricultural supply, and groundwater recharge. Beneficial uses of the watershed *groundwater* include: municipal and domestic supply and agricultural supply. Beneficial uses of Malibu Lagoon include: recreation (water contact and non-contact), saline water, preservation of rare endangered species, marine habitat, and fish spawning. Beneficial uses of the nearshore zone (zone bounded by shoreline and a line in the Santa Monica Bay 1000 feet from the shoreline or the 30-foot depth contours, which ever is further from the shoreline) include industrial service supply, navigation, recreation (water contact and non-contact), commercial and sport fishing, marine habitat, fish spawning and shellfish harvesting (RWQCB, 1975) Many people believe that these beneficial uses, particularly in the lagoon are threatened by unnatural sedimentation, runoff, salinity fluctuations, nutrients, and possibly pathogens

Types of Monitoring and Response Protocols

Two types of standard monitoring include 1) water-based monitoring where water or sediment quality is directly monitored and 2) bioassessment and biomonitoring where the health of the ecosystem is measured Recent research has shown that biomonitoring is important for showing trends and helping to identify impaired waterbodies (Allayaud, 1992) Historically, in the Malibu Creek watershed, water-based monitoring has been the predominant type, but emphasis is gradually shifting towards including biomonitoring in sampling programs and in special studies Monitoring described in this report is based on concentrations rather than mass emission rates.

Allayaud (1992) summarized seven major types of monitoring programs as defined by the EPA: 1) trend monitoring, 2) baseline monitoring, 3) implementation monitoring, 4) effectiveness monitoring, 5) project monitoring, 6) validation monitoring, and 7) compliance monitoring All of these kinds of monitoring occur in the Malibu Creek watershed to varying degrees. The bulk of the effort, however, is compliance (NPDES self-monitoring) and baseline monitoring (the Los Angeles County Department of Public Works and the Regional Water Quality Control Board).

Response protocols are the institutionalized reactions to environmental problems which may occur during crisis situations or may be indicated by longer term monitoring efforts. In the Malibu Creek watershed, there are formalized procedures for reaction to crisis situations (sewage spills, evidence of major illegal actions), but there are few institutionalized procedures for low level problems that are observed during long-term monitoring programs.

General Description of Uses of Monitoring Data

The various agencies that monitor in the Malibu Creek watershed have different mandates for their programs. Some of the agencies are focused on health issues, some on regulating (or responding to regulation requirements) water quality and still others on preserving resources. Ultimately, the individual goals, even if specific actions are required under NPDES permits, are to evaluate the water quality and prevent degradation

¹ The Regional Board an updated Water Quality Control Plan (Basin Plan) on June 13, 1994, that lists additional beneficial uses and mineral quality objectives for the Malibu Creek watershed This Basin Plan is expected to be adopted by the State Board in the fall of 1994

of the beneficial uses of the watershed. Specific aspects of the monitoring programs are theoretically designed to provide information to enable a determination of the overall ecological health of the watershed.

The general purposes of the different components of the monitoring programs are as follows:

Physical data help determine habitat suitability and provide known variables for calculations of hydrodynamic models.

Measurements of *water quality parameters* allow for the determination of ambient levels of pollutants, the calculation of nutrient budgets, and the identification of non-compliant dischargers.

Sediment grain size is used to evaluate the condition of benthic habitat. Sediment is analyzed because sediments are often the ultimate sink for some chemicals and indicate benthic habitat condition.

Examination of *fish populations* aids in the assessment of the of the micro-environment and the general health of the ecosystem.

Analysis of *accumulated chemicals* in fish or other organism's tissue helps establish the presence of certain otherwise undetectable contaminants (or low levels of contaminants) in a given aquatic area

Monitoring for *pathogens/viruses/indicator bacteria* provides information that can relate outbreaks of disease to presence of waterborne infectious agents and to potential sources (USEPA, 1991)

Methods used for this study

This study involved a background literature search of studies of the watershed area, interviews with staff of monitoring agencies and research of current NPDES and Waste Discharge Permits. Interviews included staff of the various agencies which conduct regular monitoring or conducted past monitoring in the Malibu Creek watershed, concerned persons, activists or other agency members who have an interest in the watershed (see Appendix I for questionnaires). Staff of the monitoring agencies (with the exception of the staff of the Calabasas landfill) were asked about details of their programs and about other concerns they have about monitoring in the watershed. Other concerned individuals were asked for their assessment of the monitoring efforts.

For this report, information about the monitoring programs, including location of stations, parameters analyzed, frequency of monitoring, and response protocols were compiled. It is based on this information that recommendations are made. It is beyond the scope of this study to analyze the actual data and make more general recommendations about specific water and sediment quality problem areas and needed changes in monitoring programs based on those results. It is expected that the more comprehensive Soil Conservation Services Natural Resources Study currently underway and other studies by the Santa Monica Bay Restoration Project and the Regional Water Quality Control Board will enable future more comprehensive recommendations.

OPINIONS OF PUBLIC ACTIVISTS

Many newspaper articles in the summer of 1992 chronicled beach closures and the existence of pathogens in drains and natural channels and beaches along the Santa Monica Bay (see appendix II for recent newspaper articles). This media coverage has heightened the public concern about the pollution problems in the watersheds of the Santa Monica Bay. A 1992 Santa Monica Bay Restoration Project survey of 500 Los Angeles county residents found that 55% of those surveyed would not enter the water because of concern about water pollution, and 77% think that the Bay is "very" or "somewhat" polluted (SMBRP, 1992d). Environmental activists have long been concerned about the problems in the Bay and in Malibu Creek Watershed in particular.

In the past few years, activists have investigated human health problems in Malibu waters. Dr. Jeff Harris, a family medicine practitioner in Malibu, found *Pseudomonas aeruginosa* (ear infection source) and *Citrobacter freundii* (gastrointestinal illness source) in Malibu Lagoon (Harris and Evans, 1991). Recently, Santa Monica Bay Restoration Project member organizations and others have tested and reported on pathogens in the Malibu Lagoon (SMBRP, 1992e). Heal the Bay issues an annual Beach Report Card (Heal the Bay, 1992) which is based on data from the Los Angeles Department of Health Services' and the City of Los Angeles' bacteria monitoring program (described below). This annual report presents data to show that during and up to three days after storms, the drains and natural channels which flow into Santa Monica Bay (including Malibu Creek) generally have extremely high indicator bacteria densities. The Surfrider Foundation has an ongoing program in which members or citizens perform simple bacteria screening tests of beach waters. This effort is primarily aimed at increasing public awareness of the potential human health problems in the Bay (Saltman, 1992; Surfrider Foundation, 1991)

Interviews with individuals concerned with the Malibu Creek watershed pollution problems indicate the presence of a great deal of informed enthusiasm for improving the water quality of the Malibu Creek watershed. Following is a summary of the opinions of the interested persons:

Public opinion about general watershed issues:

- ✘ In general people feel that Malibu Creek, Lagoon and surfzone are "possibly" or "definitely" impaired for use by human and wildlife (many individuals were concerned about influx of pathogens, influx of excessive fresh water, and artificially high nutrient levels), and
- ✘ Some people feel that the public is not educated about the impacts of their own activities (dumping oil down their drains, piling horse manure along stream beds or disposing of used diapers along the creeks, for example),

Public opinion about the existing monitoring programs:

In addition to generating public concern about environmental problems, activists also push government or private agencies to change their policies. To this end, when asked about how well government agencies are monitoring the Malibu Creek watershed, almost all of the activists said that the quality of monitoring is poor. It should be pointed out, however, that none of the activists were able to name all of the agencies that monitor the Malibu Creek watershed. The monitoring agencies have not had the resources to effectively publicize all of their sampling efforts

Complaints about the monitoring agencies from the activists familiar with the Malibu Creek watershed include:

- ✘ There is not enough cooperation or communication between the government agencies. Agencies need to compare data;
- ✘ There is no direct and regular way to access collected data. [Although most of the activists and public had not attempted to access data sets, the general perception is that they are not easily accessible. According to the agencies, the data are available upon request, usually on hard copy and sometimes on disk. Several members of the public would like to see a centralized clearinghouse for the data. This would considerably increase the ease with which data could be acquired (see discussion of this below)];
- ✘ There is a lack of defined goals for the monitoring programs;
- ✘ Significant reports and information that relate to the Malibu Creek watershed have not been incorporated into NPDES permits;

- ☐ Data gathering is sporadic, not collected continuously or frequently enough;
- ☐ Public is not being adequately and promptly warned about human health dangers around the lagoon;
- ☐ There is no built-in program to follow-up on problems aside from crisis-type problems (spills etc.)
- ☐ There is a lack of uniform data reporting format;
- ☐ There is no regional plan for an overall monitoring strategy, and
- ☐ There is no ecological monitoring over time (for long-term analysis).

Public opinion about gaps in data:

- ☐ Storm drain runoff upstream should be monitored;
- ☐ Temperature should be monitored by all dischargers because of the steelhead trout run;
- ☐ Horse properties should be monitored,
- ☐ More shoreline stations should be added (these would be used to sample for indicator bacteria and viruses);
- ☐ Malibu Creek just upstream of Serra Retreat should be monitored,
- ☐ More biomonitoring is needed;
- ☐ There is not a sufficient number of flow gauges in streams, and
- ☐ There is insufficient upper watershed data.

Public opinion about goals of monitoring programs:

The concerned individuals feel that the overall goals of monitoring programs should include identifying the sources of effluent and pollution, identifying the sources of nonpoint contaminants, detecting degradation, and meeting human health and wildlife standards. Some persons think that the data should establish a baseline of conditions against which new monitoring can be compared in order to pinpoint problems. Others feel that the monitoring should be driven by public policy to answer specific questions and that there should be justification for the chosen parameters. Some persons would like to see more public input on decision-making, which they feel is justified, since the monitoring is funded by public money.

Public opinion about public access to the data and public education:

Ideas for public outreach include utility bill flyers to educate the public about the impacts of individuals activities, weekly notification sent to the media grading beach waters on an A, B, C, D scale with trends included, a central clearinghouse for all monitoring data, and a regular compilation of the data to be available at the Malibu public library

Public opinion about source of funding for additional monitoring:

In the interviews, the concerned persons were asked "How should increased monitoring be paid for?" Answers ranged from "the users" to "the polluters":

- ⌘ There should be special assessments watershed-wide ("most direct way to assess people");
- ⌘ There should be increased beach parking fees ("\$1 for monitoring"), and
- ⌘ There should be increased water or usage fees ["polluter should pay, not recreational users" (e.g., through beach parking fees); "permit fees (for polluters) are way too low"] (Harris, 1991; interviews with various individuals, see acknowledgements).

CURRENT STATE OF MONITORING IN MALIBU CREEK WATERSHED

A substantial amount of surface water, ground water, sediment and fish tissue monitoring occurs in the Malibu Creek watershed. Seven agencies conduct ten major monitoring programs which include samples from over 40 surface water or sediment stations and over 70 groundwater wells (see appendix III). Overall, samples are analyzed for a complete suite of chemical constituents ranging from conventional pollutants to organic chemicals, pesticides, and toxicity and bacteria and viruses. It is estimated that these major programs cost roughly \$1,170,000 in 1993 (table 1). The majority of money is spent for self-monitoring programs by the Las Virgenes Municipal Water District and the County Sanitation Districts of Los Angeles County. In addition, many other monitoring programs focus on a variety of environmental aspects of the watershed, including water levels in the lagoon, brush and weed clearance compliance, and water quality (on a less formalized basis). All of the regular monitoring programs are summarized in the following sections.

Water quality sampling stations are concentrated in the lower Malibu Creek watershed (figure 4) and in the Malibu Lagoon (figure 5). There is some duplication of sampling station locations by different agencies, most notably the Malibu Creek at Cross Creek station (table 2) which is sampled by 4 different agencies (see legends of figures 3 and 4 to see other duplication of other stations). The locations of sampling stations by agency are summarized in table 3.

In the Malibu Creek watershed, rain gauges are maintained by five different agencies and one individual: California Department of Parks and Recreation, the Los Angeles County Department of Public Works, the Los Angeles County Fire Department, County Sanitation Districts of Los Angeles Counties (Calabasas Landfill), the Ventura County Public Works Agency and Tim Thomas². These gauges are shown on figure 6.

² The buildings at Stunt Ranch were destroyed in the Old Topanga fires of October, 1993

Table 1: Major Monitoring Programs of Water, Sediment or Fish Tissue in Malibu Creek Watershed

Agency	Number of Stations	Constituents monitored	Approx. Costs (\$)
Las Virgenes Municipal Water District (LVMWD)	23 surface water, sludge, sediment, soil, fish tissue, effluent, influent and 8 groundwater	Conventional Nutrients Bacteria/viruses Metals Organic Chemicals Pesticides Visual observations EPA priority pollutants Chronic Toxicity Other	500,000 (annual) 112,000 enhanced* * projected costs for 1993 one year enhanced program
Topanga-Las Virgenes Resource Conservation District (TLVRCD)	8 surface water	Conventional Visual	4,310 (1993)
Los Angeles County Department of Public Works (LACDPW)	1 surface water	Conventional Nutrients Bacteria Metals Organic Chemicals Pesticides Other	8,000 (annual)
Regional Water Quality Control Board-Planning Division (RWQCB-P)	4 surface water	Conventional Nutrients Organic Chemicals Visual observations	1,305 (1992)
Regional Water Quality Control Board-Mussel Watch Program (RWQCB-MW)	3 sediment	Metals Organic Chemicals	6,000 (1992)
Regional Water Quality Control Board-Toxic Substances Monitoring (RWQCB-TSM)	1 fish tissue, sediment	Metals Organic chemicals	7,000 (1992)
Regional Water Quality Control Board-Compliance Monitoring (RWQCB-C)	Tapia effluent	Conventional Metals Organic chemicals	1553 (1992)
Los Angeles County Department of Health Services (DHS)	7 surface water	Bacteria Visual Observation	30,000 (annual)
City of Los Angeles, Department of Public Works, Bureau of Sanitation, Environmental Monitoring Division-Hyperion STP (LA-EMD)	5 surface water, sediment, fish tissue	Conventional Nutrients Bacteria Organic chemicals Visual observations EPA priority pollutants Other	59,636 (1992)
County Sanitation District of Los Angeles County-Calabasas Landfill (CSDLAC)	70 groundwater wells 3 surface runoff stations (Storm Water NPDES permit)	Conventional Nutrients Metals Organic chemicals EPA priority pollutants Other	400,000 (1993-94)

Table 2. Agencies with sampling programs at Malibu Creek at Cross Creek Road.

Station	Constituents monitored	Agencies (see Table 1 for abbreviations)
Malibu Creek @ Cross Creek Road	Conventional Nutrients Bacteria Organic Chemicals Visual observations	LVMWD
	Conventional Nutrients Bacteria Metals Organic chemicals Pesticides Other	DPW
	Conventional Nutrients Organic chemicals Visual observations	RWQCB-P
	Bacteria	DHS

Table 3: Malibu Creek watershed monitoring agencies and the general locations of their sampling stations

Agency	General Locations of Stations*
Las Virgenes Municipal Water District (LVMWD)	Malibu Creek-middle and lower Malibu Lagoon Ocean shoreline Las Virgenes Creek Sludge Farm (near Las Virgenes Creek)
Topanga-Las Virgenes Resource Conservation District (TLVRCD)	Malibu Lagoon
Regional Water Quality Control Board-Planning Division (RWQCB-P)	Malibu Creek-lower (Cross Creek Road) Malibu Creek-middle (Salvation Army camp) Medea Creek Triunfo Creek
Regional Water Quality Control Board-Mussel Watch Program (RWQCB-MW)	Malibu Lagoon
Regional Water Quality Control Board-Toxic Substances Monitoring (RWQCB-TSM)	Malibu Creek-lower (just above stream gauge)
Regional Water Quality Control Board-Compliance Monitoring (RWQCB-C)	Tapia Water Reclamation Facility effluent
Los Angeles County Department of Public Works (LACDPW)	Malibu Creek-lower (Cross Creek Road)
County Sanitation District of Los Angeles County-Calabasas Landfill (CSDLAC)	Calabasas landfill and just offsite (near Agoura, Las Virgenes and Lindero canyons)
Los Angeles County Department of Health Services (DHS)	Ocean shoreline Malibu Creek-lower (Cross Creek) Malibu Creek-middle (Salvation Army Camp) Cold Creek
City of Los Angeles, Department of Public Works, Bureau of Sanitation, Environmental Monitoring Division-Hyperion STP (LA-EMD)	Ocean shoreline at Big Rock Rd Ocean nearshore/offshore off Coral Beach Ocean nearshore/offshore off Las Flores Beach

* For purposes of this report.

Upper Malibu Creek is defined as the creek above Malibu Lake

Middle Malibu Creek is defined as the reach from Malibu Lake to Cold Creek

Lower Malibu Creek is defined as the reach from Cold Creek to the estuary.

Figure 4: Map locations

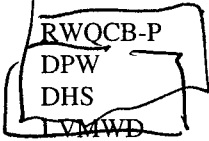
Location	Station Number/Name	Agency
1	S-1: shoreline station at Big Rock Road	LADPWSB-Hyperion <i>not in shed</i>
2	DHS 004: 22956 Pacific Coast Highway	DHS <i>not in shed</i>
3	Beach stations (B-1, B-2) (see fig 5) Beach stations DHS 005; DHS 006	LVMWD LVMWD
4	Lagoon stations (see fig 4)	
5	DHS 007: 25000 Malibu Road	DHS <i>not in shed</i>
6 ✓	S-7	LVMWD
7	Cross Creek Cross Creek Cross Creek R-4	<i>Repetitive</i>  1
8	R-3	LVMWD
9	R-13	LVMWD
10	Stream gage TSM samples just upstream form gage	DPW RWQCB-TSM <i>not pertinent</i>
11	R-2	LVMWD
12	Discharge 001	LVMWD
13	R-1 Malibu Creek at Salvation Army Camp Bridge "Above Tapia" station	LVMWD RWQCB-P 2 DHS
14	R-9 Malibu Creek upstream from Las Virgenes confluence	LVMWD
15	Discharge 002	LVMWD
16	R-6	LVMWD
17	Rancho Las Virgenes Sludge farm (wells, sludge)	LVMWD <i>Doesnt matter wells</i>
18	Calabasas landfill (67 wells)	CSDLAC
19	Madea Creek at Kanan Road	RWQCB-P 3
20	Triunfo Creek at Kanan Road	RWQCB-P 4
21	Cold Creek at Piuma Road	<u>DHS</u>
22	a) N-1 b) N-2 nearshore station	LADPWSB-Hyperion
23	a) B-1 b) B-2 offshore at 45 m	LADPWSB-Hyperion
24	a) C-1 b) C-2 offshore at 60m	LADPWSB-Hyperion
25	a) E-1 b) E-2 offshore at 150 m	LADPWSB-Hyperion
26	Stream gauge	Ventura County Public Works

Figure 4 Locations of sampling stations for major monitoring programs in the Malibu Creek watershed

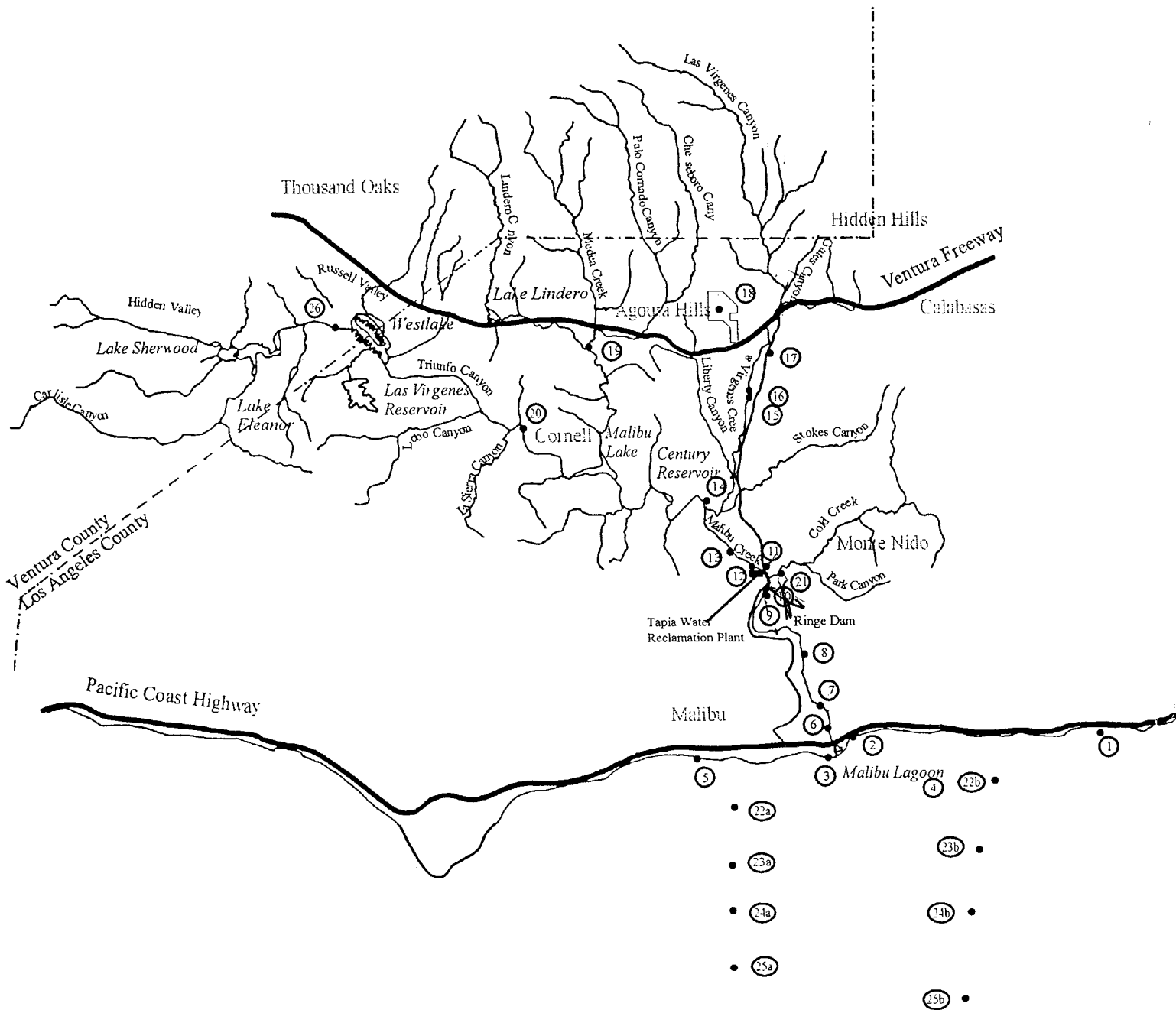


Figure 5: Map Locations for Lower Malibu Creek and Malibu Lagoon sampling stations

<u>Number</u>	<u>Name</u>	<u>Agency</u>
1 ✓	B-1: Ocean 50 yards east of mouth of lagoon, ankle depth DHS-005	LVMWD DHS
2 ✓	B-2: Ocean 50 yards west of mouth of lagoon, ankle depth DHS-006	LVMWD DHS
3 ✓	S-1: Lagoon at mouth near sand bar where usually breached	LVMWD
4	D channel	RCD
5	S-6: Lagoon "D" channel	LVMWD
6	B channel	RCD
7	C channel	RCD
8	E channel	RCD
9 ✓	S-2:	LVMWD
10 ✓	"G": Lagoon at Pacific Coast Highway	RCD
11 ✓	S-7: Lagoon at shopping center, 900' north of PCH	LVMWD
12	R-4: Malibu Creek at Cross Creek Road Malibu Creek at Cross Creek Road Malibu Creek at Cross Creek Road	LVMWD An RWQCB-P 5 DPW
13 ✓	R-11: at center of lagoon, near west shore R-11: at center of lagoon, near west shore	LVMWD RWQCB-MW
14	A channel	RWQCB-MW
15	C channel	RWQCB-MW

Figure 5 Locations of sampling stations in Malibu Lagoon/Malibu Civic Center area (base map after TLVRCD, in progress and Harrison, 1990; drain identification from Philip Williams, et.al., 1992).

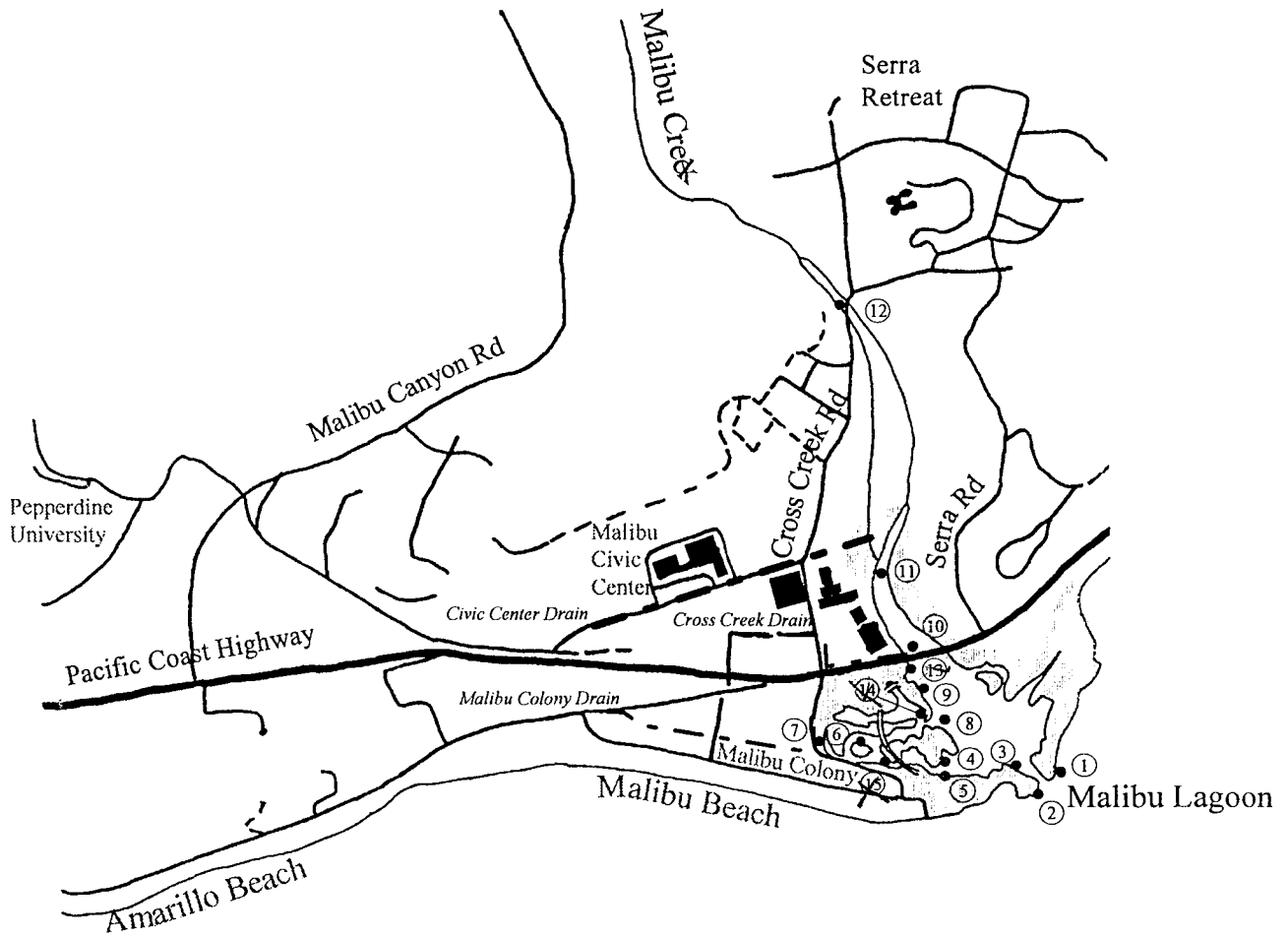
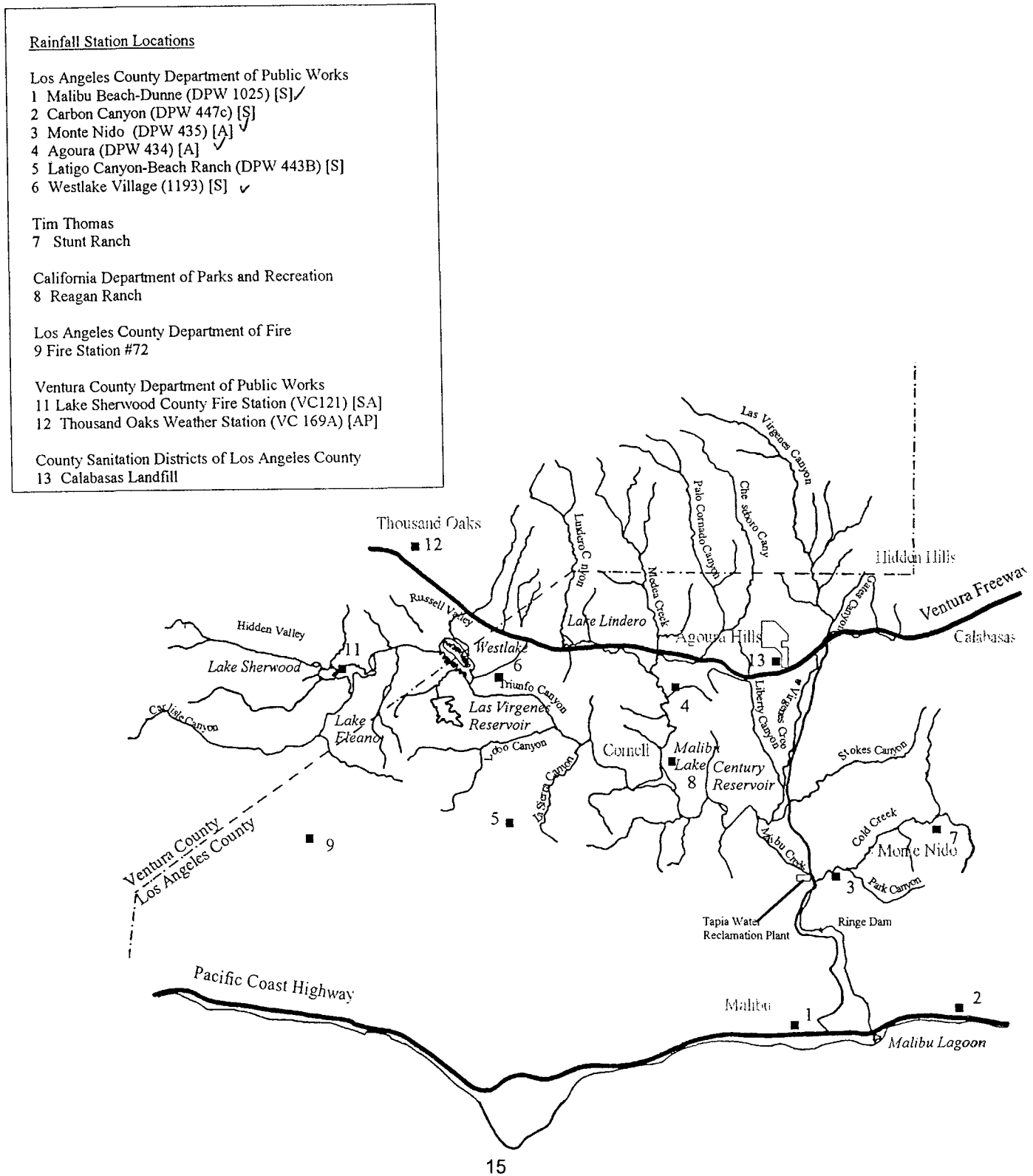


Figure 6 Locations of rain gauges in Malibu Creek watershed (based in part on LACDPW, 1992b).



AGENCIES THAT MONITOR REGULARLY IN MALIBU CREEK WATERSHED

This section contains summaries of the regular monitoring programs in the Malibu Creek Watershed. These summaries are based primarily on interviews with staff at the different agencies. Agencies/organizations are listed in alphabetical order.

California Coastal Commission, Enforcement Department

The California Coastal Commission, Enforcement Department, monitors for incidents of illegal grading and illegal soil and vegetation removal. The overall goal is to reduce impacts on the environment due to development in coastal areas. The Department does not have a regular inspection schedule, but instead relies on public complaints. While they are investigating specific complaints in an area, however, they visually inspect the surrounding properties for any other infractions. In order to reduce soil erosion, the Department requires that plants be present and sand bags be installed on graded areas. In general, they request that problem sites be restored, and only do they, if necessary, impose fines. The Commission has special set-back requirements for developments near streams (Posner, 1993)

California Department of Parks and Recreation

The California Department of Parks and Recreation monitors the water level of the Malibu Lagoon, keeps written and photographic records of various projects within the park system (re-vegetation) and maintains two rain gauges in the watershed. The overall goal of the Department is to "protect the natural and cultural resources" of the area. They monitor the water level in the lagoon in order to determine the schedule for manually breaching the lagoon's sand bar (which prevents flow of ocean water into and out of the lagoon). This sand bar is naturally breached by water action during large storms. Prior to 1984 (?), the lagoon was managed by the Los Angeles County Department of Beaches and Harbors, they maintained a lagoon record, including complaints from adjacent homes and flooded septic fields.

Malibu Lagoon water level is monitored by a set of measure tapes attached to a bridge over one of the channels of the lagoon. The water level is checked by park personnel twice a day (at approximately 8:30 a.m. and 2:00 p.m.) (O'Ferrall, 1993). When the level is above 3.5 feet, the Department considers manually breaching the sand bar by a bulldozer (occasionally a midnight "shovel brigade" of unknown persons manually breaches the sand bar before the Department is able to deploy the bulldozer). The Department plans to replace the tape and to re-survey the lagoon to get a more exact calibration of the water level measure. The Department has agreements with certain groups (including surfers) that

- 1) the Department will breach the lagoon within 48 hours if the water level reaches 3.7 feet on the tape measure and is rising at a faster rate than 6 inches per 24 hour period (CDPR, 1984), and
- 2) they will only breach the lagoon after 5.00 pm on weekdays during outgoing high tides.

The Department is considering installing a flip-down type sign or a chalkboard which would warn beach users about unsafe swimming conditions immediately after the lagoon is breached. The sign would be placed near the entrance to the beach parking lot.

A rain gauge, located at Reagan Ranch, is maintained for fire prediction purposes (Goode, 1992)

California Department of Water Resources, Division of Safety of Dams

The California Department of Water Resources, Division of Safety of Dams' staff periodically inspects the jurisdictional dams in the Malibu Creek watershed. The inspections are generally performed in the spring or early summer of each year. Water levels in the lakes are noted at the time of the inspections. In addition, all alterations or modifications to the dams are required to be pre-approved by the Division. Any construction related to an alteration or modification is inspected and monitored by Division staff to assure the safety of the dam.

In recent years, the Division staff have noted problems in the outlet valves at Lake Eleanor, Lake Sherwood, Century (Crag's) and Westlake (Protero) dams. These outlet works were all repaired by the responsible agencies (Sanchez, 1993).

California Regional Water Quality Control Board, Los Angeles Region

The Los Angeles Regional Water Quality Control Board's monitoring program's goals are to anticipate, prevent, identify, and remediate water quality problems. A specific goal is to implement a comprehensive regional surface water monitoring network. The Board implements four regular monitoring programs and several variable, infrequent or one-time programs. The Monitoring programs (regular programs are denoted with an asterisk) include

- *Ambient Surface Water Monitoring Network
- Coastal Monitoring/Bay Protection and Toxic Cleanup program
- *Toxic Substances Monitoring Program
- *State Mussel Watch Program
- *Discharger Self-Monitoring (see sections for each discharger)
- *Compliance Monitoring
- Focused and Special Studies Monitoring

Regional Surface and Groundwater Monitoring Program

The Surface Water Monitoring Program was started in 1986 when special funding was available for monitoring activities. At first, the program concentrated on locating hot spots, primarily focusing on volatile organic chemicals. General mineral data were also collected for updating the Board's *Water Quality Basin Plan*. In 1989, the program was revamped and the focus shifted to 1) acquiring a substantial mineral quality database for the Basin Plan update, 2) producing formalized published biennial *Water Quality Assessment Reports*; 3) investigating nonpoint versus point source causes of contamination, 4) developing water quality objectives, and 5) analyzing trends. The overall monitoring program was designed to look at impacts from residential urban runoff, organic enrichment, habitat alteration, and barriers to fish migration. Specifically, in the Malibu Creek watershed, the program monitors the indicators of potential impacts from the Tapia Wastewater Reclamation Facility and impacts from residential areas (lawn runoff and septic tank input).

The Board uses monitoring data to identify problem waterbodies as part of the biennial *Water Quality Assessment (WQA) Report* and to evaluate water quality objectives as part of the Basin Plan update program. The *Water Quality Assessment Report* is a published inventory of regional waterbodies and water quality conditions. Two statewide *Water Quality Assessment* reports have been produced (1990 and 1992) using a newly developed WQA database. Similar reports have been published as far back as the 1970's. These volumes have interpretive sections to explain water quality data and summaries of water body quality including areas of concern, the volumes do not include actual data. The Basin Plan, the regulatory framework for the

region, has been recently updated³ (CSWRCB, 1990b; CSWRCB, 1992b). The Board does provide an annual report that contains actual water quality data.

Originally the Board's program concentrated on volatile organic chemicals (which are expensive to analyze) Very few, if any, volatile organic chemicals were detected, and so the program emphasis was switched to minerals, nutrients, metals, and other parameters. The program is dynamic and the Board tries to tailor sampling strategies to respond to particular problems in each watershed. Overall, the Board's surface water monitoring program is an ambient-monitoring network.

In the Malibu Creek watershed, the surface monitoring program has historically (1986-1991) had two stations on Malibu Creek: Cross Creek Road (below Tapia) and Salvation Army Camp (above Tapia). These stations were monitored on an annual basis for minerals, nutrients, metals, radiological, volatile organic chemicals and pesticides (sporadic choice of parameters from year to year). Triunfo Canyon and Medea Creek stations were added in 1992 and will continue to be monitored in future years. These tributaries were added because of the lack of upper watershed information, the requirements of the Basin Plan update, and a response to the Malibu Creek watershed planning effort

The Board's stations are sampled on an annual basis during dry weather conditions, usually in October through December. In 1992, the Board sampled for minerals, nutrients, metals and coliform. If there is a logistical problem, or storm, the sampling is delayed. The planning staff performs the sampling as part of their overall jobs. The 1992 budget for the entire Region was \$35,000, the Malibu Creek watershed costs were approximately \$320 for labor and \$985 for lab costs⁴

Sampling procedures follow standard QA/QC for holding times and maintaining preservatives. Samples are kept in ice chests and field sheets (with photos) are filled out for each station including observations about habitats, fish, water color, trash, recreational uses, and physical evidence of problems. The Board uses the (California and EPA certified) California State Department of Health Services laboratory. The laboratory does not report if it meets holding times. The Board occasionally sends in duplicate samples as a check. Data from the lab are checked by the Regional QA/QC officer at the Board for variations and chemical balance (i.e., ionic balance).

The sampling data are kept in notebooks and on a Lotus spreadsheet program on a PC. Hard copies are available to the public upon request. In house, the data are used for updating the Basin Plan water quality objectives, for input into the Biannual Water Quality Assessment Database. Trends are analyzed and the results of sampling one year may alter decisions about sampling the next year. The data are regularly sent to the State Department of Water Resources.

If serious problems show up in the samples (or the staff discovers physical evidence of spills or other problems in the field), staff write a memo and notify the proper division within the Regional Board or other appropriate agency. High radiological samples are resampled.

Because the funding for the regional surface water monitoring program is uncertain from year to year, the number of stations and parameters is somewhat fluid over time. The core program goal, though, is to consistently sample one or two stations on each waterbody. Overall, the goal for the future is to have fewer stations monitored more frequently (two to four times a year). If funding were cut, the Board would eliminate sampling where other agencies are already sampling or scale back parameters to specific parameters related to problems (e.g., Malibu Creek may be cut back to just nutrients because of the issue of natural versus effluent

³The updated Basin Plan was adopted by the Regional Board on June 13, 1994, adoption by the State Board is anticipated in the fall of 1994 (RWQCB, 1994).

⁴ It is anticipated that less monitoring money will be available in 1994-1995

contributions) The Board considers the upper creek an important area to sample because of the lack of data on the tributaries and the large amount of current housing development. The problems in the upper watershed identified in the 1992 *Water Quality Assessment* report include fish population decline, spawning decline, and impacts on recreational activities.

Ground water in certain areas of the Los Angeles Region has been extensively sampled in the past in special studies. The Malibu Creek watershed ground water has not yet been studied by the Board (Smith, 1992).

Toxic Substance Monitoring Program

The Toxic Substance Monitoring Program (TSM) was started in 1976, funded by bond monies, in order to detect organic chemicals (pesticides) and metal pollutants in fresh, estuarine, and marine waters in the state (mostly in fresh). The State Water Board funds and administers the TSM program and the State Department of Fish and Game implements the program. The program specifically targets areas that are known or suspected to be impaired (Jurkevics, 1992, CSWRCB, 1990a, 1991, 1992a).

In this program, toxic substances are detected by analyzing samples of tissues from fish or other aquatic organisms and sediment samples. Generally, concentrations of these substances are too low to detect in the water column by direct water sampling methods. Ten trace metals and 45 pesticides and PCBs are analyzed on composite samples. Sample values are then compared to human health and aquatic life standards. A certain amount of luck is involved during sampling as sometimes not enough or an unusable type (not appropriate for the study methods) of fish are obtained.

Each year approximately 100 to 110 stations are sampled state-wide. The Malibu station, an infrequent station, is included because it is the tributary to Malibu Lagoon, is downstream of a sewage treatment plant and is in the eye of the public. Malibu Creek at Cross Creek Road was sampled in 1985. In 1991, the Department was only able to collect one fish at that location, so the creek was sampled again in 1992 at a new station closer to Tapia. The location of this new station was chosen on the basis of accessibility, being still downstream from Tapia. In 1992, a sufficient number of fish (chubs) were obtained. The new station will be sampled again in 1993 only if metals or organic chemicals were detected at elevated levels in the 1992 sampling. In 1992, sediment was also collected for analysis.

TSM sampling is performed annually. Based on previous data or lack of data, Regional Board staff determines which stations get sampled. The sampling schedule is predetermined by the Department of Fish and Game schedule. There is some flexibility in the schedule; staff will come back if they encounter a sampling logistical problem. Fish and Game's Pollution Control Lab in Rancho Cordova analyzes the samples. Samples are transferred to the laboratory on dry ice. Duplicate samples are analyzed.

The data are compiled on a Rbase database PC computer system at the State Water Board. The data are used to assess water bodies, trends are analyzed and regions are compared. 95 and 85 Elevated Data Levels (EDLs - internal comparative measures) exceedances give an estimate of hot spots across the state. Annual reports contain the quantitative data and, upon request, the Board sends copies of the current data to the public. The final 1991 report will be published in late spring of 1993. Results from the 1992 sampling should be available in late 1993, after the State Board issues official notification (Jurkevics, 1992).

In 1992, the state-wide program was budgeted at \$350,000. The Malibu Creek portion of the study cost approximately \$7000 (\$3500 for sediment and \$3500 for fish tissues). The station would probably not be sampled again if funding for the program were cut.

State Mussel Watch program

The California State Mussel Watch Program (MW) was created in 1977, as a long-term coastal monitoring program to identify areas with high levels of toxic substances. The program is administered by the State Board

and locally coordinated by the Regional Board while the California Department of Fish and Game conducts the field and laboratory work. The program usually involves submerging bags of "transplanted" mussels (clams may be used in selected freshwater areas) for a period of three to five months and then analyzing the organisms for bioaccumulated metals and organic chemicals, including, at some sites, PCBs. Transplanted mussels are collected in a designated clean area, usually Bodega Bay in northern California.

There are approximately 20 stations in the Los Angeles Region. The station locations vary from year to year in order to address specific problems and to get complete coverage of the region. Four stations in the Los Angeles Region are considered long-term, three in Los Angeles Harbor and one in Mugu Lagoon. Malibu Lagoon was added to the program due to public interest. The locations of the stations in Malibu Lagoon were chosen to complement the Topanga-Las Virgenes Resource Conservation District (RCD) studies. Three of the RCD's established stations were chosen to give a good spatial distribution within the lagoon: open, channel and back channel locations. Specifically, stations are in Channels A and C and near the Pacific Coast Highway.

Sediment samples substitute for live clams or mussels in Malibu Lagoon due to large salinity variations which would kill the test organisms. The sediments are collected annually, in late summer or fall, by Mussel Watch-dedicated Fish and Game personnel. The schedule is predetermined, and there is little flexibility needed in case of inclement weather or conditions.

Sediment samples from Malibu Lagoon are sampled for metals and organic chemicals but not PCBs (there is no likely source in Malibu Creek Watershed for PCBs; previous samples did not detect PCBs). Interpretation of results are complicated by the extremely short residence time of sediment within the Lagoon.

The collected data are compared to human health and aquatic life protection standards. Few tissue standards exist for shellfish, however, and there are currently no sediment quality objectives. State-wide, areas with higher than normal levels of contaminants are identified. The information is used to help provide information on possible human health impacts, to help locate illegal discharges and problem areas, and to monitor permitted dischargers. Data are compiled on a Rbase database system at the State Board. The data are published yearly or periodically by the State Board and, after the yearly press release, the data are available to the public under a "preliminary" status. Trends in the data are analyzed, and the results of sampling often alter the sampling regime for the next year.

If funding were cut, the number of stations would have to be decreased; an emphasis on special projects such as tracking DDT and PCBs in certain sites would remain. The total 1992 budget for the State was \$270,000; the Malibu Lagoon portion was \$6000. Future mussel watch type monitoring of Malibu Lagoon may be included in the Bay Protection and Toxic Cleanup Program (described below) or may be eliminated entirely due to budget constraints since the original program was funded by a bond source that terminates at the end of fiscal-year 1993-94 (Birosik, 1992).

Coastal Monitoring Bay Protection and Toxic Cleanup Program

The Bay Protection and Toxic Cleanup Program (BPTCP) was created by the State legislature in 1990 to address the problems of toxic pollution in enclosed bays and estuaries. The program has four major goals: 1) to protect existing and future beneficial uses of bays and estuaries, 2) to identify and characterize toxic hot spots, 3) to plan for prevention of future pollution and remediation of hot spots, and 4) to develop a database for each enclosed bay or estuary (CSWRCB, 1992c). Currently, in the Los Angeles Region, a monitoring program has been developed for each waterbody and initial screening work is being implemented for each waterbody as funds become available. After the initial screening, each waterbody will be given a hot spot designation ("Known", "Potential", "None") and further confirmatory monitoring will be conducted as necessary.

Malibu Lagoon is currently listed as an "unknown" toxic hot spot due to the lack of data. Based on what little data are available, the lagoon would not seem to meet the criteria for designation as a "known" toxic hot spot.

It should be pointed out that assessment of bacteriological contamination or nutrient enrichment is not part of the program (i.e. is not a "toxics" concern).

As part of initial BPTCP screening, Malibu Lagoon was sampled in January, 1993, for sediment toxicity. Sediments were collected by Fish and Game staff and toxicity tests were run using amphipods and urchins at a cost of approximately \$2000. The results of the January monitoring will be used to make a further assessment of the lagoon's toxic hot spot status (Birosik, 1992).

Compliance Monitoring Program

The Regional Water Quality Control Board conducts periodic inspections and compliance monitoring of all regulated dischargers in the region. The dischargers are required to submit self-monitoring reports; the compliance monitoring is a check-up system.

There are two types of regular unannounced inspections which are performed on NPDES or on WDR dischargers: A-type, which involves visual inspection and taking of samples, and B-type which involve only a visual inspection of the premises and taking of samples if there is a problem noted. "Complaint" inspections occur in response to complaints on a case-by-case basis. The inspection types are assigned to each discharger based on their level of threat to water quality. The major NPDES permittees are inspected with at least one A-type and one B-type inspection per year. Generally, the permittees provide, as required, complete monitoring reports and timely reports about their spills or problems.

Samples taken in A-type inspections are of effluent only. The Board does not have the resources, other than for special studies or as part of the regular surface and groundwater monitoring programs, to monitor the receiving water stations of the dischargers. The policy, as explained by one of the engineers, is to take samples of the same constituents that are required in the monitoring reports. In reality, however, not all of the parameters are included in the compliance inspections due to budget constraints.

For the fiscal year 1991-1992, the final laboratory allocation for all monitoring in the Los Angeles Region, compliance or other, was \$189,475. The funds for this program come from different parts of the state budget; due to the nature of the state budget and funding within the state, actual amounts that are available for laboratory costs of compliance monitoring is generally uncertain. Within the year, the individual engineers in charge of compliance monitoring are not always sure how much money they will be allotted. In 1992, the laboratory allocation report was delayed until November. The delays make advance planning difficult as there are over 500 NPDES dischargers in the region. There is some flexibility in the laboratory budget, so that towards the end of the year, some of the Board's divisions can perform extra monitoring with any leftover funds.

For the Malibu Creek watershed, the dischargers that are compliance-monitored are:

Tapia Waste Water Facility (LVMWD): One A-type and one B-type inspection was conducted in 1992. Compliance sampling for the A-type inspection did not include all of the monitored parameters in the permit and the cost was \$1,553 (effluent sample)

Hyperion Treatment Plant (LA-EMD): Since the Board inspects and samples the effluent only and the effluent outfall is located far south of the watershed, monitoring near their outfall is not included in this study.

Texaco Service Station: This remediation project recently closed, so this is not included in this study (records from past inspections are available at the Board).

Prudential Insurance Co. of America: This remediation project recently closed (been rescinded), so this is not included in this study (records from past inspections are available at the Board).

Calabasas Landfill (CSLAC): This facility is scheduled to have B-type inspections every quarter. Due to staff constraints, the landfill is inspected twice a year. Pictures are always taken at inspections.

Malibu Media Center (Albert Winnikoff): Inspection on 3/22/92 indicated that this project was under construction: This discharger will have B-type inspections.

Malibu Cross Creek Center (Koss Real Estate Inv). This discharger has B-type inspections

State Farm Mutual Automobile Ins Co . This discharger has B-type inspections.

County of Los Angeles, Department of Public Works (Malibu Water Pollution Control Plant): This discharge had a B-type inspection 11/24/92 and an A type inspection 6/11/91.

Underground Storage Tanks

The Regional Water Quality Control Board maintains a list of leaking underground storage tanks. This list is updated bi-annually and includes tank leaks from Ventura and Los Angeles counties. When a leak of a tank is reported, the local agency performs the initial investigation and then refers the case to the Regional Board if there is evidence of groundwater contamination. The published list of leaks includes the names of the local agencies, the location of the tank, the status of the case and the type of chemical in the tank. According to the October 1992, list, there were approximately 50 leaking tanks in the Malibu Creek watershed (report dates range from 1985 to present). Of these, most cases were being handled administratively by the Los Angeles County Department of Public Works, and approximately 10 cases were handled by the Regional Board (includes Texaco station described in separate section below) (RWQCB, 1992a).

County Sanitation Districts of Los Angeles County, Calabasas Landfill, Waste Discharge Requirements Order No 89-053 (File No. 82-67, CI 4992), adopted May 22, 1989

The County Sanitation Districts of Los Angeles County, under Waste Discharge Requirements (Order No. 89-053) issued by the Regional Water Quality Control Board, are required to monitor the Calabasas Landfill located near Agoura. The 416 acre landfill was a Class I facility (i.e., accepted hazardous wastes in portions of the landfill in addition to accepting Class II and Class III materials) through July, 1981, when it voluntarily converted to a Class III landfill (nonhazardous solid and semi liquid wastes). Nonhazardous wastes were then deposited directly over the hazardous wastes, separated only by a thin veneer of daily cover. Disposal rate during 1992 was approximately 2300 tons per day

Forty feet thick surficial aquifers percolate downgradient from the landfill and are intercepted at the canyon mouths by manmade barrier and extraction systems, if these waters were not intercepted, they would drain into Las Virgenes Canyon and Lindero Canyon Hydrologic subareas. The extracted water is passed through an airstripping tower to remove any volatile compounds and used for dust control at the landfill. The landfill has three additional subsurface barriers and a system of groundwater monitoring wells. Over 50 monitoring wells are currently sampled. Additional groundwater wells are being installed. Landfill gas is also collected. In addition to the barrier system, several liner systems are in place in the newer disposal areas. The liner systems employed onsite include both compacted clay liners and composite liners systems consisting of both clay and synthetic liners. A leachate collection and removal system is constructed in each liner. The bedrock below the landfill is composed of shales and sandstones and conglomerates of the Topanga and Medelo Formations and have been described as non-water bearing by the California Department of Water Resources. Background groundwater is locally of poor quality (high natural levels of total dissolved solids, sulfate and chloride).

Data required, by the Waste Discharge Requirements Monitoring and Reporting Program, from the 22 deep bedrock (CA-series) and 2 alluvial (MW-series) monitoring wells, 17 barrier extraction wells (E-series) wells and 26 barrier monitoring wells are: water level, velocity and direction of groundwater flow, general minerals,

organic chemicals, pesticides, and metals. Self-monitoring reports are submitted monthly to the Regional Water Quality Control Board both on hard copy and on disk in Lotus spreadsheet format (RWQCB, 1989b; Ponak-Bacharowski, 1992, CSDLAC, 1993).

SWAT (Solid Waste Assessment Test) monitoring of the landfill was initiated in 1987, and indicated that the subsurface canyon waters are contaminated by volatile organic chemicals in 2 of the 5 canyons. Currently, the landfill is undergoing verification monitoring to determine if two of the subsurface barrier systems have been breached. Studies involve soil samples of bedrock and of surface alluvium in offsite locations. The Districts are preparing a hydrogeologic study of the landfill as required by the Regional Board as part of the verification (or evaluation) monitoring program⁵ (RWQCB, 1989c)

Preliminary groundwater studies for proposed Liberty Canyon Development Environmental Impact Report, located directly west of the Calabasas Landfill, show some contamination that is possibly from the landfill. Groundwater, soil, creek sediment and surface water studies, within the proposed project buffer zone area, show that chemicals, including benzene, and other organic chemicals are present in elevated concentrations (Van Kekerix, 1992).

Costs of the Calabasas landfill monitoring program, including manpower and laboratory costs, were projected to be \$400,000 in 1993 (Huitric, 1992).

The Districts had monitored surface runoff at the site between 1986 and 1991 in accordance with a 1986 Regional Water Quality Control Board request. Since 1992, the site has been in compliance with the NPDES requirements under the general industrial storm water permit. A storm water pollution prevention plan and a monitoring plan are in place at the site in compliance with the NPDES permit. Three NPDES sampling locations are included in the sampling plan. The runoff samples are analyzed for pH, conductivity, total dissolved solids, total organic carbon, oil and grease, and volatile organic chemicals (CSDLAC, 1993). The Landfill also maintains a rain gauge that is monitored during rainy weather for their operational needs (Lalca, 1993).

Lake Sherwood Ranch

The staff of the Lake Sherwood Ranch development monitors the water chemistry of Lake Sherwood. The privately-owned lake was dredged and recontoured as part of the construction of the housing development. Fish are present in Lake Sherwood; they do not stock the lake with fish. The management "blue-stones" the lake (adds copper sulfate) (Freeman, 1993).

Las Virgenes Municipal Water District-Triunfo County Sanitation District: Tapia Water Reclamation Facility

The Las Virgenes Municipal Water District joined the Triunfo County Sanitation District in the mid-1960s to build the Tapia Water Reclamation Facility (TWRF) which is located at 731 Malibu Canyon Road in Calabasas. The present day TWRF design capacity is 16.1 million gallons per day (mgd); in 1989, the plant was treating an average of 7-8 mgd. The District states that its goals are to provide environmental protection as well as to conserve water within the water district by promoting the use of reclaimed water.

⁵ SWAT Report findings as stated in a letter from the Regional Board on May 13, 1993 stated that nine volatile organic compounds "were detected in ground water monitoring wells downgradient of subsurface barriers 2 and 5". Some of these constituents were detected in concentration which exceed the California Department of Health Services' (DHS) Maximum Concentration Limits (MCLs).

A verification monitoring program has been developed and implemented at Calabasas Landfill and includes further hydrogeologic studies near Barriers 1, 2 and 5. It is anticipated that the verification monitoring program will be completed by December, 1994 (RWQCB, 1993a).

The Regional Water Quality Control Board administers 5 monitoring programs (as part of separate NPDES or non-NPDES Requirements) that are conducted by the District. Their major NPDES permit (CA00560014) was renewed on April 11, 1991, and included new chronic toxicity testing. Additional monitoring by the District includes 1) a one year enhanced monitoring program⁶ which was negotiated with environmental groups and 2) other voluntary water quality sampling.

The TWRP provides reclaimed water for irrigation throughout the watershed. Overflow of reclaimed water is discharged either directly into Malibu Creek near the facility, through percolation ponds at Tapia park, or into the creek as overflow from the District's reservoir. Reclaimed water is monitored for flow, coliform and turbidity. Sludge is injected into soil at a sludge farm at Rancho Las Virgenes located at 3242 Las Virgenes Road.

Discharge locations are:

Discharge 001: Primary outfall into Malibu Creek.

Discharge 002: Reservoir No. 2 outfall. This is the point of discharge of surplus effluent from reclaimed water holding basins.

Discharge 003: Malibu Gauging Station. This discharge point is associated with percolation beds which are used periodically during summer, if requested by California Department of Fish and Game or California Department of Parks and Recreation, to maintain flow in creek to sustain fish life.

In addition to sampling at the discharge points, the District monitors receiving water stations along Malibu Creek and in the Malibu Lagoon. The District has 1 effluent sampling station at the TWRP and 12 official sampling stations in the creek, of which 8 are used. The location of sampling stations has evolved over time in response to public or environmental concerns.

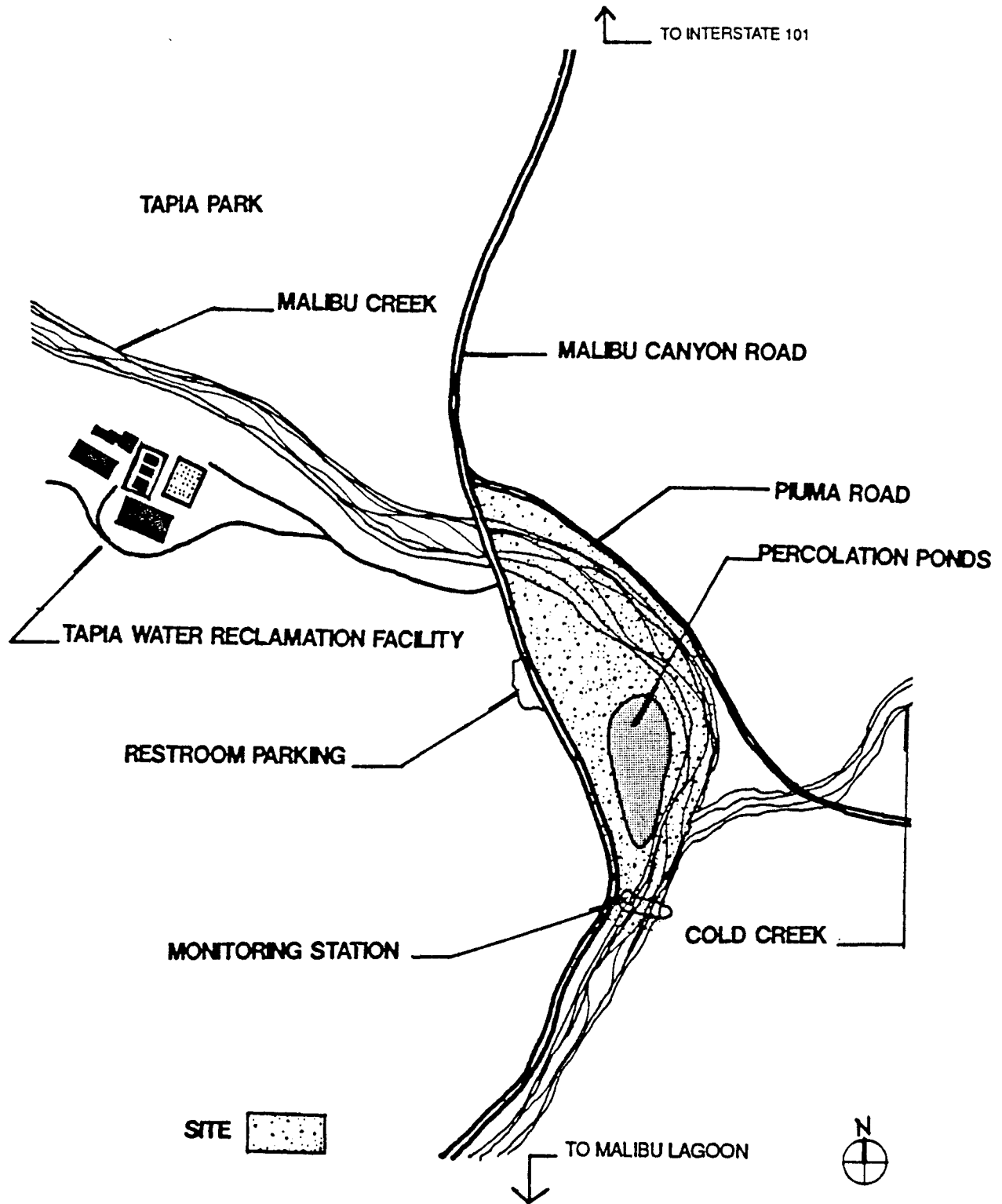
The District has a set monitoring schedule. If it rains, staff continues to sample if conditions are safe. Their monitoring reports include a notation about weather conditions. A sampling-dedicated biology staff member from the lab performs all of the sampling in order to maintain a uniform, standardized record of visual and biological observations. Sites are sampled during daylight hours and the sampler usually starts at the furthest-upstream station and proceeds downstream, although occasionally the order is reversed.

The District views the monitoring data as a report card that they are doing their job adequately. They also use the data to resolve any operational problems. The data are computerized on a Lotus spreadsheet and are available to the public upon request. The District regularly sends copies of the data to a mailing list of 15 agencies. The District maintains its own lab; the budget for sampling per year is approximately \$500,000. The enhanced sampling program added another \$112,000 (RWQCB, 1989a, Witbeck, 1992; CalTrout, 1989b).

One of the discharge points (003) is through a set of 16 percolation ponds located in Tapia Park (Figure 7). These ponds were previously owned by private individuals but are now owned by the California Department of Parks and Recreation; the District leased the ponds until 1984 and now has an informal agreement with the Department for discharge through the ponds. The ponds are adjacent to Malibu Creek, and, when functioning correctly, allow water to slowly seep into the ground water and then to join the creek through subsurface flow (Butterbaugh, et. al., 1990). The percolation ponds, however, are not all in working order; some discharge directly into the creek (see section on California Department of Parks and Recreation) (Goode, 1992). Another issue is that monitoring of the ponds are not directly covered by any of the permits (Witbeck, 1992).

⁶ The first lagoon sampling event of the Enhanced Monitoring Project occurred in August of 1993 and continued through 1994 (at least 6 sample events). In the Malibu Lagoon and lower creek, eleven sites were sampled for physical and biological parameters. In addition, bird censuses and fish assemblage characterization were part of the study (Malibu Surfside News, 1993, LVMWD, 1994).

Figure 7. Percolation Ponds near Tapia Water Reclamation Facility (from Butterbaugh, et al , 1990)



Las Virgenes Municipal Water District NPDES PERMITS:

Waste Discharge Requirements and NPDES Permit No. CA0056014 for Las Virgenes Municipal Water District (Tapia Water Reclamation Facility) (CI 4760) (Order No. 89-076 finalized 7/24/89 revised 9/12/91)

This permit covers the monitoring of both treated effluent that is discharged to Malibu Creek and receiving waters (Malibu Creek itself). Physical parameters, metals and organic compounds and acute toxicity were covered by the original permit; chronic toxicity testing was added in a revised permit in 1991. There are three discharge stations (see above). 001, 002 (discharge from reservoir #2), and 003 (Malibu gaging station) and 12 additional creek stations (of which only 8 are used by the LVMWD) (see appendix III). The receiving water monitoring reports include visual observations and photos. This monitoring is "enhanced" (see below) by the agreement between LVMWD and environmental groups (RWQCB, 1989a, RWQCB, 1991).

Waste Discharge Requirements and NPDES Permit No. CAG990037 for groundwater dewatering-Las Virgenes Municipal Water District at Tapia Water Reclamation Plant, Calabasas, CA (CI 7128) finalized 3/31/92

This permit covers the discharge of up to 2 mgd groundwater during the construction of the new district headquarters. The discharge is at discharge serial No. 001. An operations and maintenance plan is part of the permit. Quarterly monitoring reports are required and include information about general minerals and USEPA priority pollutants (RWQCB, 1992b)

NON-NPDES PERMITS:

Waste discharge Requirements for Las Virgenes Municipal Water District (Tapia Water Reclamation Facility), File No. 64-104 (CI 6189) finalized 6/22/87

These Requirements are for the effluent that goes to the reclaimed water distribution system. According to the permit, the plant may reclaim up to 6.5 mgd of municipal wastewater for commercial purposes, parks, and school irrigation; the Requirements have not been updated to reflect the larger capacity of the reclamation facility. The effluent is sampled just prior to 001 effluent pump station as water leaves the plant. The monitoring reports submitted to the Regional Water Quality Control Board do not indicate the number of gallons per day but show total amounts for each month. In the recent summers, discharges to the creek or percolation ponds (in disrepair) averaged over a half million gallons per day (RWQCB, 1987a, LVMWD, 1989-1994).

Discharged reclaimed water (million gallons):

<u>Month</u>	<u>Indirect discharge</u>	<u>Direct discharge</u>		<u>Total</u>
	<i>Water Users*</i>	<i>Malibu Creek</i>	<i>Percolation Ponds</i>	
July, 1992	218.157	5.7	20.3	244.157
August, 1992	218.751	3.8	13.6	236.151
Sept., 1992	194.561	4.3	29.1	227.961
July, 1993	213.600	7.6	13.2	234.400
August, 1993	183.000	21.9	26.3	231.200
Sept., 1993	173.2	22.6	26.1	221.900

* Reclaimed water was delivered to the following irrigation users: Rancho Las Virgenes, Las Virgenes Valley area, Calabasas Area, Tapia Spray Fields, Tapia Yard, Pepperdine University, Western LVMWD, Triunfo County SD.

Reclaimed Water Requirements for Las Virgenes Municipal Water District (File No 78-35) (CI 6456) finalized 2/26/79

These Requirements cover reclaimed water for irrigation. The District has not been sending in monitoring reports to the Regional Water Quality Control Board and claims that these Requirements have been superseded by WDR File No. 64-104. This permit has not been officially rescinded (i.e., formally terminated) by the Regional Water Quality Control Board, and a residential landscape irrigation system in Calabasas has been regularly inspected as part of these Requirements by the Regional Board. If monitoring reports were to be submitted, they should include flow, coliform group and turbidity data (RWQCB, 1979b).

Waste Discharge Requirements for Las Virgenes Municipal Water District (Rancho Las Virgenes) (File 78-26) (CI 6430) finalized 6/25/79

Sludge⁷ at the Rancho Las Virgenes sludge farm is monitored under these Requirements. Aerobically digested sludge is pumped from Tapia plant via a 6-inch cement-lined iron pipe. Some of the sludge fields were reconfigured just prior to May 15, 1992. Eight groundwater monitoring wells (upstream and downstream in three areas), as well as sludge and soils, are sampled (RWQCB, 1979a; LVMWD, 1992b).

ENHANCED MONITORING:

The enhanced monitoring program was the result of an agreement between the District and environmental groups. To supplement regular NPDES monitoring, the District has agreed to perform additional monitoring for one year starting in March of 1993. The samples were analyzed by researchers at the University of California, Los Angeles, under a \$112,000 contract. This program included state-of-the-art gene probe virus sampling. The program was intended to help answer some of the questions about the District's impact on Malibu Creek and lagoon and questions about their contribution of pathogens to the lagoon (LVMWD, 1992a).

ADDITIONAL VOLUNTARY MONITORING:

During the Pathogen Study sponsored by the Santa Monica Bay Restoration Project (SMBRP, 1992e), the District added enterococcus sampling at some of the stations. The District has continued the enterococcus sampling since the study has terminated. In addition, the District has continued to monitor two stations in the lagoon that are not in the current NPDES permit, S-1 and S-7, which are monitored for BOD, total coliform, salinity, and fish and insect identification. These stations are included in the enhanced monitoring program. Other voluntary monitoring includes sampling of reclaimed water for coliform at various points along the distribution system in the watershed (Witbeck, 1992).

Lee Kats, Natural Science Division, Pepperdine University, Ongoing Studies

Lee Kats, a biology professor at Pepperdine, and his undergraduate students have undertaken a study of amphibians (newts and tree frogs) in the Cold Creek area. Since 1992, they have monitored the larvae and adult populations. Although most of their research involves the amphibian behavior, they are looking at environmental impacts. They have performed a minor amount of visual observations of amphibians in other

⁷ Recently, the Joint Venture (LVMWD and TCSD) completed construction of the \$50 million Ranch Las Virgenes Solids Handling and Composting Facility. The facility enables the District to reuse nearly all of the solids that it collects from sewage. The process at the facility is almost entirely automated. Methane gas is recycled and used to heat the processing tanks. The end product, a fertilizer, is sold to farmers and nurseries (Los Angeles Times, 1993 and 1994a).

areas of the watershed. The study costs approximately \$9000 per year and is funded by a National Science Foundation/Research Experience for Undergraduate Students grant⁸ (Kats, 1992).

Los Angeles, City of, Department of Public Works, Bureau of Sanitation, Hyperion Treatment Plant, Santa Monica Bay Monitoring Program, NPDES Permit CA0109991 (CI 1492), finalized June 22, 1987

The City of Los Angeles operates the Hyperion Plant which discharges treated municipal wastewater to the Santa Monica Bay through a 5-mile long outfall. Although monitoring is mandated by their NPDES permit, the stated goal of the Department's monitoring program is to characterize the chemical and physical aspects of Hyperion's influent and effluent waters and "to assess changes in the marine environment attributable to the discharges from Hyperion" (LADPW, 1990). In addition to influent and effluent monitoring, the Department maintains an immense monitoring program in the Santa Monica Bay including 17 shoreline, 11 nearshore and 40 offshore sampling stations. The City has been monitoring in the Bay since 1950 but has been using high technology methods (described below) only since 1987 (LADPW, 1991; Johnson, 1992). The Hyperion monitoring program is included in this review because the nearshore and offshore stations, although not located directly at the Malibu Creek outflow, are located to each side of the Creek out in the Bay, and the data could be extrapolated to include the Creek outflow area

Of the Santa Monica Bay monitoring stations, the furthest north shoreline station (S-1) is located at Big Rock Road. "S" shoreline stations are monitored daily for indicator bacteria using a membrane filtration technique. Currently, the laboratory turn-around-time is 24 hours for coliform and 48 hours for enterococcus. The City is developing new laboratory methods that will possibly reduce turn around time to 4 or 5 hours.

The northern nearshore and offshore stations are along isobaths in the Santa Monica Bay (figure 4 above): stations N-1 (9 meters), B-1 (45 meters), C-1 (60 meters), and E-1 (150 meters) are in a transect out from Coral Beach in Malibu and respective N-2, B-2, C-2 and E-2 stations are located in a transect out from Flores Canyon. These stations are sampled for indicator bacteria and water quality parameters daily, weekly or monthly and are scanned weekly for a surface to bottom profile of temperature, salinity, transmissivity, dissolved oxygen and pH using a Sea-Bird Model SBE-9 electronic water-quality sensor system. The thin organic microlayer at the air-sea interface at station C-2 is sampled for oil and grease, total organic carbon and indicator bacteria. Sediments from shore stations are analyzed for oil and grease, priority pollutants, total organic carbon, pore water, sulfides, and grain size, and macrofauna (in the sediment). Quarterly trawling along the 60 m isobath (station C1) is performed in order to determine species assemblages. These species are listed in the Annual Assessment Report. Muscle and liver tissue from hornyhead turbot and muscle tissue from rock and yellow crab are analyzed semi-annually at C1 and Pt Dume respectively. Muscle tissue from white croaker at Malibu Pier and sport fish (Halibut, barred sand bass), caught between Malibu and Point Dume, are analyzed for priority pollutants semi-annually. Additional sampling includes ambient water toxicity and virus sampling (RWQCB, 1987c; LADPW, 1990, Johnson, 1992).

Sampling is performed by the biology staff on a set schedule, and samples are analyzed by the lab maintained by the Department. According to staff, strict QA/QC procedures are followed; the lab always meets holding times. Weather conditions, including the amount of rain, at the time of sampling are noted in the monitoring reports.

The data are compiled on a mainframe computer. Trends in the data are analyzed and multivariate statistical analysis is performed. Extensive weekly, monthly, quarterly and annual reports are submitted to the Regional Water Quality Control Board as well as the USEPA and others on a mail list (150 copies of the annual report are printed). An annual summary, including assessment and interpretation of the data, is also submitted. The

⁸ Dr. Kats received a National Science Foundation grant to study the effects of the Old Topanga Fire on the newts in the Cold Creek area.

NPDES permit stipulates that data be sent to the USEPA on ASCII or EBCDIC format on computer disk, but at this time only part of the dataset is sent in on disk to the Regional Water Quality Control Board.

Data are transferred daily to the Department of Health Services via modem. Heal the Bay receives copies of all reports and is notified immediately by phone as soon as problems are noted. The public has full access to the data upon request including ASCII formatted data for at least the last 5 years (Johnson, 1992; LADPW, 1990).

From June, 1990, to June, 1991, 16,000 analysis were performed on water, sediment and marine animal tissue samples from the stations in Santa Monica Bay at a cost of approximately \$2.8 million. In 1992, the annual cost for stations N1, B1, C1, and E1 was computed at \$59,636 (LADPW, 1991; Johnson, 1992).

Los Angeles County Agricultural Commissioner

The Los Angeles County Agricultural Commissioner's office monitors brush and flammable vegetation or other combustible growth on unimproved lands. The Commission is responsible for removing brush and weed growth within 200 feet from any structure. Annuals are removed to "mineral earth" (i.e., cut down to the ground) and brush/perennial are "lollypopped" or thinned and spaced. The distances of removal may be different on a case-by-case basis depending on wide range of criteria, including topography. Generally, within 50 feet of a structure, they cut the brush down to a 2 inch stubble and within 150 feet they cut annuals down to 18 inches and perennial are lollypopped. Weed abatement notices are normally mailed in January or February with clearing deadlines in May for Malibu and the surrounding areas.

The Commission emphasizes that abatement procedures are proactive regarding soil erosion. Almost all clearing operations in erosion prone areas are done by hand crews and areas subject to landslides are not worked. Annual grass and weed growth are contour-diced, whenever possible. Excessive clearance, soil disturbance and root removal by private individuals who have hired tractor dozers to remove hazardous vegetation has led to incidents or soil erosion. The Commission staff feels that the weed abatement program helps to reduce and control major brush fires which can lead to rapid soil erosion.

The Commission is also responsible for pesticide use enforcement. Enforcement includes the monitoring and sampling of pesticide applications, whenever possible, and the handling pesticide use complaints. Complaints range from the result of long-lasting or excessive odors from pesticide spraying in homes to observations of illegal applications of pesticides in agricultural areas. General monitoring/sampling to detect pesticides in water sources was conducted from approximately 1974 to 1986 (see below), but due to budgetary constraints, this program was curtailed (Makos, 1992).

Los Angeles County Department of Beaches and Harbors

The Los Angeles County Department of Beaches and Harbors' lifeguard division performs visual inspections of the beach near the Malibu Lagoon during daylight hours year-round. If they observe material (motor oil, for example) coming out of storm drains, they notify the Los Angeles County Department of Public Works. If they observe large and frequent tar balls either on the beach or coming out of drainages, they collect and send samples of the tar to Chevron Refinery for identification. The lifeguards also respond to public complaints about spills or leakages.

When the Malibu Lagoon is breached, the lifeguards post a hazard sign on the beach near the lagoon. The regularly maintained tide board records the date of the last lagoon breaching (Saylor, 1992).

Los Angeles County Department of Health Services

The Los Angeles County Department of Health Services monitors shoreline stations near the Malibu Creek watershed and stream stations in Malibu Creek near the Tapia Water Reclamation Facility (TWRP). The monitoring program has been in place for 30 or 40 years. The Department "monitors water quality" to detect potential public health hazards due to bacterial or virus contamination but has no written mission statement. In addition to regular monitoring, the Department relies on public complaints for information leading to spot inspections on sewage spills and illegal discharges.

In 1987, the Department started a Bay monitoring program (with a written protocol); the frequency of their sampling was increased and sampling locations were added along the coast. This program was the result of greater public awareness stemming from the 1984 Bradley-Deukmejian governor race and a large Venice pumping plant sewage spill of 4 million gallons in 1987.

About twenty years ago, the Department sampled many more stations than today along the coast near Malibu (30 compared to 13 today), but the results consistently came up negative; "nothing was happening." Currently, there are 59 ocean stations monitored in Los Angeles County, and additional stations at recreational lakes which are monitored during the summer. Because there are no standards for streams, the Department does not generally sample streams (with rare exceptions, including Malibu Creek). They do have standards, however, adopted from State standards, for fresh and ocean water swimming areas.

The Department has two stream sampling locations in Malibu Creek (one above TWRP at the Salvation Army Camp and one at Cross Creek road) and one location on Cold Creek (figure 4). Along the coast, the Department samples, on a weekly basis, 13 beach stations from Leo Carrillo Beach to Topanga Beach. All stations are monitored for total coliform, fecal coliform and enterococcus.

The monitoring of the stations near the Tapia Water Reclamation Plant represents the only inland non-recreational-related sampling that the Department performs in the county. The reason that the Department monitors near the Tapia facility is because of "curiosity," and the amount of public inquiry. They monitor monthly above and below the Tapia Plant, and often the bacteria counts are lower below than above the plant.

The beach stations are roughly evenly spaced along the coast with extra stations at Surfriders Beach and at the mouth of the lagoon (300' north of mouth of lagoon). They try not to duplicate Hyperion monitoring and focus mostly on storm drains and on locations where natural channels discharge to ocean. They do not sample directly in front of the storm drains but off to the side. The reasons that they do not sample right at the storm drains are:

- ⌘ They might "blow tubes" (bacterial levels would exceed the dilution scale >16,000),
- ⌘ In 1986, they conducted a study of many samples around and in storm drains and discovered that the bacteria is greatly dissipated at 10 yards away from the drains, and
- ⌘ Three storm drains are permanently posted no swimming within 100 yds and so for sake of uniformity of station data, all drains are sampled at 50 yards. The Department of Beach and Harbors posts "caution" signs at all flowing storm drains.

The Department does not sample in Malibu Lagoon because those samples would be "too high" (exceed dilution scale) and there is no standard with which to compare. Departmental staff feels that "although human enteric virus has been detected in the Malibu Lagoon, there is no epidemiological data to support a conclusion that the public engaging in recreational activities in the ocean waters adjacent to the lagoon is at risk. There is no scientific basis for concluding that there is a health hazard in this area." In addition, "the ability to detect virus in ocean waters is not a viable monitoring tool." Five or ten years ago, they did have a program in which

they would be notified whenever the lagoon was breached. According to Departmental staff, samples taken at the beach immediately after breachings, however, did not show any cause for alarm

On a monthly basis, the supervisor prepares a sampling schedule (including domestic water) for the environmental health specialists; sampling is only a small part of their jobs. The Department samples on Mondays (or Tuesdays if holiday) due to lab constraints. There is some flexibility in sampling sites on a weekly basis. For instance, if a gate is locked for a particular station, they skip the station. When there is a large storm, they listen to television and determine whether they need to go check for problems. When a high tide correlates with a storm, they sometimes have problems with sewage systems. If there is a problem, the Department will sample weekly in a particular area until a damaged sewage system is repaired. The Department has a detailed ocean water monitoring protocol, but no separate written field protocol (staff are trained and they use USEPA's *Standard Methods for the Examination of Water and Waste Water*, 18th edition). They use ice chests and get samples into the lab in 4 hours.

Within the Department, all monitoring data is evaluated as it is received from the laboratory. If bacterial counts are high, the staff routinely does nothing until the next sample is taken. If two sample counts (a week apart) are high, then they begin an investigation to discover the cause of elevated counts (i.e., sewage leaks or other problems). The Department feels that this kind of sampling results in extreme variability in data from samples taken within a few feet of each other. If they know why they have a problem, they close the beach (decision made on a case by case basis) until they can take more samples. Counts go up after it rains or when there are higher flows. The closures are more often the result of physical evidence of spills rather than sampling.

Most of the southern beach closures and reopenings are based on monitoring by the City of Los Angeles Department of Public Works Bureau of Sanitation-Hyperion (LA-EMD). The City uses a different method of analysis than the County Department of Health Services and samples on a daily basis using a method (membrane filter) that gives results within 24 hours. If elevated bacterial counts are detected in the Malibu area, the Department might ask the LA-EMD take additional samples. The Department has a written protocol for beach closures which includes numbers of gallons which correlate with distance of beach closure away from spill sites. If there are two consecutive periods of elevated counts then the beach will be posted with a caution sign while the cause is investigated. The data collection is coordinated with Los Angeles City Bureau of Sanitation and with Los Angeles County Sanitation District (7 stations shore from Long Point to Outer Cabrillo Beach -- not near Malibu).

In general, if two consecutive weeks of sampling show high counts or a pattern is observed then the inspector will look for sewage leaks, particularly near the restaurants east of Surfrider Beach. When extra samples are taken, the lab will, if necessary do weekend samples. They get presumptive values within 48 hours. Samples taken on Monday give results on Thursday afternoon. Extra samples have been taken in the Malibu area in response to public complaints two or three times, but have not shown high counts.

The Department's data, with the exception of the Tapia stream data, are on a Lotus spreadsheet program and they will give the data to the media and the public upon request at cost of copying. They do not analyze trends. A monthly report that contains a complete tabulation of the bacteriological analyses is mailed to governmental agencies and to Heal the Bay (at their request and own expense).

The cost of sampling for the Bay program is \$100,000 annually. The 13 northern coastal stations and the Tapia stations cost approximately \$30,000 per year. If funding were cut, the Department would maintain the beach stations near recreational area in order to protect bathers and would eliminate other stations. The Department does not have funds that are specifically designated for monitoring; the sampling budgets comes from general funds. Because the Malibu watershed and the Bay are areas of political concern, the Department does not plan to cut the program back. At most, they would reduce monitoring frequency back to monthly from weekly.

In addition to water monitoring data, the Department maintains "cards" on animal keepers (over 10 horses for instance), there are 18 animal cards in Malibu Creek Watershed area. The Department conducts sanitation inspection at these properties once a year or upon complaints. Animal owners are not allowed to pile manure near the streams or allow the manure to attract flies or affect water quality (Petralia, 1992).

Los Angeles County Department of Public Works

Surface Water Monitoring Program

The Los Angeles County Department of Public Works has been monitoring storm and dry weather flows sporadically in Los Angeles County since the 1920's. In 1967, they initiated a regular monitoring program consisting of 30 stations throughout the county. Over time, station locations changed somewhat due to operational needs (new channels, etc.) or because water quality needs warranted changes to get a better overall picture. An in-house laboratory was used until 1984. In 1984 (partly in response to Proposition 13), the Department conducted a study of the monitoring program and cut back the number of stations. The staff concluded that the program was too expensive and that there were many duplicated efforts producing similar data by various State and local agencies. The Department believed that, by sharing and exchanging data among various agencies, the number of their monitoring stations and constituents could be reduced without compromising the overall usefulness of their data and the intended purposes of their program at that time. Therefore, from July 1984 to April 1988, the Department drastically cut back the number of parameters for 21 selected stations to include only total dissolved solids, pH, and dissolved oxygen. An additional annual sample, however, was collected from each station for extensive analysis including heavy metals and pesticides. Malibu Creek was continuously monitored through this period but with just the limited parameters (Hildebrand and Cheung, 1992).

In 1988, knowing that EPA would soon be issuing water quality regulations, the more rigorous program was resumed (back to the 1984 levels) for 28 stations throughout the county. In 1988, a Storm water/Urban Runoff "Early Permit" was granted to the Department under the existing NPDES permitting system (NPDES permit CA0061654, CI 6948). The Department is implementing a pilot NPDES stormwater/urban runoff monitoring program that includes grab sampling and flow-composite sampling (collected with newly installed automatic water samplers).

The NPDES permit⁹ covers most of Los Angeles County (2700 square miles) and is being implemented in three phases that correspond to the three different major drainages: Phase I, Santa Monica Bay drainage, began in July, 1990, phase II, upper Los Angeles River and San Gabriel River Drainage; and phase III, Lower Los Angeles River, Lower San Gabriel River and Santa Clarita Valley Drainages. The City of Thousand Oaks will be issued a separate storm water permit. Under the terms of the NPDES permit, the Department is the "Principal Permittee" and at least 85 other agencies and cities are considered "Co-Permittees." Original Co-permittees within the Malibu Creek watershed included Agoura Hills and Westlake Village. Other cities have since become co-permittees: Malibu, Calabasas, and Hidden Hills. As part of Phase I of the NPDES permit, Agoura Hills, Westlake Village, Calabasas, Malibu and Los Angeles County have submitted to Regional Water Quality Control Board lists of existing Best Management Practices (Street maintenance, refuse maintenance, illegal discharge/disposal practices, storm drain maintenance, and construction) (RWQCB, 1990d, LACDPW, 1990; LACDPW, 1992c, Pavsek, 1992). The Department plans to continue to monitor their existing 28 stations monthly on a grab basis as they slowly phase in automated stations (which will be sampled bimonthly) under

⁹ A large amount of progress has been made by the Los Angeles County Department of Public Works and associated co-permittees in 1993 and early 1994 in carrying out the provisions of the early phases of the NPDES permit requirements. The Regional Board has received, among other documents, maps of storm drains and sampling locations for the Santa Monica Bay drainage area, reports tabulating all of the historical monitoring data, and reports compiling co-permittee city's Best Management Practices.

the NPDES monitoring program. As part of the NPDES permit, the Department will be looking at and mapping land uses and will locate sampling stations in areas strategic for different types of pollutants.

Malibu Creek was not in the initial NPDES monitoring proposal due to lack of a convenient site for locating an automated fixed-site sampling station. However, in order to better estimate total pollutant loadings into the Santa Monica Bay, the Regional Board requested that the Department consider adding Malibu Creek to the NPDES Monitoring Program. The Department has initiated installation modifications and is exploring equipment power source and vandalism protection needs.

The Department views their monitoring up to this point as voluntary. The monitoring program has the following objectives:

- ⌘ To become cognizant of conditions within their facilities;
- ⌘ To protect their interest and liability as the owner of a vast flood control and water conservation system Data are collected "for our general information.", and
- ⌘ To protect the integrity of the receiving water as well as the safety of Department personnel who may conduct activities within the various facilities. In the channelized areas, which the Department own, they are interested in the quality of water going into spreading grounds and affecting the concrete structures.

Under the current monitoring program, throughout the county, the Department samples dry weather flows at all 28 stations on a monthly basis. The schedule is set in advance and each month staff sample on a different day of the week (for example, in October they sample on Mondays and in November on Tuesdays). Five people trade off the sampling duties. All of the stations are sampled in two days, usually two weeks apart. They adjust the schedule to account for holidays. If it rains, they postpone for three days. Staff covers for sick employees. Samples are sent to the lab on the day that they are collected and staff always meet holding times. They have a sampling protocol and quality assurance manual.

Storm samples are collected for 3 or 4 storms a year, preferably at least one month apart. Storm sampling is initiated if there is a Los Angeles Basin-wide storm and it rains at least 1/2 inch. The Department sampling program provides for the collection of storm samples on holidays and weekends but in the past, the Departmental staff sometimes waited to sample on the next work day. Generally, they do not get to the stations until the storm is well underway or even is over. In addition, the data for the stations are not at the same point in the storm for each station or for an individual station over time. Staff does not document the point in the storm that the sample is taken. In the new NPDES automated system, however, this timing problem will be eliminated as the gauges will automatically take the samples when the flow reaches a certain threshold.

The Department located the surface water quality station for Malibu Creek at Cross Creek Road in order to have easy access and to avoid duplication of the extensive monitoring by the LVMWD. They wanted the dry weather station to be a reasonable distance downstream from the Tapia Water Reclamation Plant, but to not be at Malibu lagoon (to avoid brackish water).

The staff chose the parameters based on the idea that they do a whole suite of everything in order to provide complete coverage at all stations. In addition, they wanted to get data in anticipation of the USEPA stormwater quality regulations. In general, they wanted to be able to answer any challenges from the public.

The monitoring program proposal submitted by the Department as part of the NPDES permit includes some additional parameters that are not present in the current program. As data are collected under the NPDES Permit monitoring program, the list of parameters for each site will be adjusted based on the test results.

The Department uses the Los Angeles County Agriculture Commission laboratory (certified by State of California). Once or twice a year, they send duplicate or composite samples to the lab as a check. In addition, the lab staff uses internal blanks. They believe that the lab does meet holding times. The lab turn-around time is 21 days.

If the Department had to cut back on sampling, they would cut back on the number of tributary stations and groundwater wells. They would keep "end-of-the-pipe" stations like Malibu Creek at Cross Creek Road because they "are concerned about receiving waters."

The Department's water quality data are computerized in a Focus database. In addition, the data are stored in STORET, a comprehensive database established and maintained by the USEPA.

The Department does not produce an annual report that includes water quality data. Data are occasionally used for special reports. They do not analyze trends, but do make some graphs of the data. They do not regularly send the data to any agency. The Department does not now coordinate surface water monitoring with any other agency, but under the NPDES permit they will coordinate with all of the cities in the Malibu Creek watershed. The public can obtain any data by asking, usually hard copy; the number of requests for data has been small in the past but has recently increased as more people become aware of the data availability

If they notice a drastic change in the value of a parameter from month to month, Departmental staff investigates the cause. They take a second sample and look for physical evidence, and if they still see a problem, they may take more samples upstream to isolate the source. If they discover an illegal discharge, they report this to the Regional Water Quality Control Board. They recognize that the Regional Board does not have the resources to always investigate the original irregularity.

Based on the current labor rates, as well as quoted prices for laboratory services, the annual cost for conducting monitoring activities in Malibu Creek station is approximately \$8,000, including overhead, mileage, and labor costs. Under the proposed automated system, the cost could be increased to as much as \$16,000 per year. This does not include a one-time cost estimated at \$50,000 for design and construction of the sampling facilities as well as maintenance cost of approximately \$2,000 per year (Hildebrand and Cheung, 1992).

Precipitation, Runoff, and Groundwater Programs

The Department of Public Works maintains rainfall gauge records, stream flow gauge data and groundwater well records. These data are used for operational ("alert" data) and reporting purposes and for the development and calibration of hydrologic models. Rain gauge data are analyzed in terms of trends. In addition, they regularly update, when necessary, rainfall mass curves for hydrologic models. The public has access to microfiches and publications all of this data at the public counter at the Department. The Department has a written mission statement and publishes an annual report with selected data (LACDPW, 1992a).

Precipitation program

The Department maintains records of at least 294 active rainfall stations in the county. Most of the standard rain gauges in the county are operated by volunteers. The volunteers check their stations once a day at set times. Automated stations have punch tapes which are removed once a month. Some of the rain gauges are "Alert" stations which have antennas and tie into the main Departmental computer system. The closest alert station to the Malibu Creek watershed is the Topanga station.

Malibu Creek watershed has 3 standard gauges and 2 automatic gauges maintained and operated by the Department (LACDPW, 1992a; LACDPW, 1992b; Bentley, 1992).

Runoff program

The runoff program was started in the 1930's to aid in Departmental operations, maintain historical record and assist watermaster committees. Seventy-seven active water-stage stations record maximum, minimum, and mean of daily flow rates. If the Department was to lose funding for runoff monitoring, they would eliminate all non-urgent stations (including Malibu).

Since 1931, the Department has maintained a "Malibu Creek below Cold Creek" continuous water stage gauge (station No. F130-R), formerly known as "Malibu Creek at Crater Camp." The station is located about 0.2 miles downstream from Cold Creek. The station gives the mean daily flow and the peak water height. As the cable car access was washed out in 1969, no physical high flow measurements are available since that year. A punch tape in the recorder is replaced early each month. The data are on a PC in a spreadsheet format; the Malibu data are regularly sent to the Las Virgenes Municipal Water District (LACDPW, 1992a; Bentley, 1992).

Well System

Water level data in groundwater wells are collected on a semiannual basis by the Department. A microfiche file on selected wells includes geologic logs and other drilling information. The files include approximately 15 wells located in the Malibu Creek watershed. Two wells (#2330 and #2311) have been monitored for water quality (general minerals) in the Malibu Creek watershed. These wells are now listed as "abandoned by the owner." Well #2330 has records from 1972 to 1986. Well #2311 has records dating to 1989 (LACDPW, 1992a; Bentley, 1992).

Los Angeles County Department of Public Works, Malibu Water Pollution Control Plant, Waste Discharge Requirements, Order No. 87-26 File No. 64-49 (Maison de Ville) CI 4673, finalized 3/23/87

The Los Angeles County Department of Public Works operates the Malibu Water Pollution Control Plant (Maison de Ville) sited at 3260 Vista Pacifica Street. The domestic sewage treatment plant discharges up to 55,000 (average 27,000) gallons per day of secondary effluent to seepage pits located in the Malibu Creek Hydrologic Subarea. Quarterly monitoring reports, submitted to the Regional Water Quality Control Board, contain monthly total waste flow (RWQCB, 1987b).

Los Angeles County Fire Department

The Los Angeles County Fire Department monitors for brush levels, performs prescribed burnings, and maintains rain gauges. The Department regularly monitors for weed abatement compliance. The Department inspects improved lots annually, with one follow-up inspection for non-compliance, before turning over non-compliers to the Los Angeles County Agriculture Commissioners office (see above). The Department advocates a soil erosion control program and tries to get private individuals to use non-soil disturbing tools to perform brush clearance.

The Department burns thousands of acres per year in "prescribed burns" that are designed to minimize soil erosion. These small fires are controlled to burn with a low intensity and a low heat in order to not kill soil microorganisms. Oak trees and riparian zones are protected. After major forest fires, the Department performs erosion control work including rehabilitation of caterpillar bulldozing lines and helicopter application of rye grass. The Department has records on the entire fire history of the watershed dating back to 1919 and of the prescribed fire history back to 1878. The last major fire in the watershed was in 1987, the Piuma-Decker Canyon fire which burned to Malibu Creek.

The Department maintains a rain gauge at the Fire Station # 72, 1832 Decker Road in Malibu. They plan to install 2 remote automated gauges in the Santa Monica Mountains (locations not yet determined) within the next 5 years. These gauges will be linked to the State Department of Forestry system and the National NOAA

system and will be used for weather prediction. The Department elected not to tie into the Department of Public Works' alert system (Spitzer, 1992).

Los Angeles County West Mosquito Abatement District

The Los Angeles County West Mosquito Abatement District monitors and treats Malibu Creek for mosquitos and black flies. They have 12 (out of 4100 sites in the county) black fly treatment sites in Malibu Creek and additional sites in Cold Creek, Las Virgenes Creek and Liberty Creek. Treatment for black flies occurs semimonthly .

Occasionally the District treats Malibu Lagoon for mosquitos when the natural discharge of the lagoon water into the ocean is obstructed, causing a mosquito habitat.

To control mosquitos and black flies, the District uses Vectobac 12AS (bacillus thurigiensis isrealensis), a biological agent specific to black fly and mosquitoes. They do not monitor water quality.

The District has not received many public complaints about chemicals and the staff feels that their control efforts are very effective (Kovaltchouk and Renwick, 1992). Others (members of the public) state that black fly complaints still occur around Serra Retreat (Harris, 1993).

Malibou Lake Mountain Club

The Malibou Lake Mountain Club owns and maintains the Malibu lake and dam. They have had a problem with silting of the lake and have historically dredged the lake periodically to remove excess sediment (Sohus, 1993) The dredged silt is stockpiled, dried, and sold to local nurseries. The Club is currently looking for landfills or other location to dispose of the excess dried sediment. In addition, according to the California Department of Water Resources, Division of Dams, they open the outlet valves to the dam once a year in order to remove sediment from the lake (Sanchez, 1993)

The Club samples fecal coliform levels in the lake from time to time in the summer months. They do not stock the lake and have "blue-stoned" (or treated with copper sulfate {CaSO₄}, a powerful algaecide) the lake when necessary (Sohus, 1993).

Malibu Cross Creek Center, Malibu Cross Creek, LTD, and Koss Real Estate Investment, owners, Waste Discharge Requirement Order No. 90-146, File No. 76-44, CI 6325, finalized September 24, 1990.

Malibu Cross Creek Center¹⁰, located at 23410 Cross Center Way, discharges up to 7000 gallons per day of domestic wastes. The 3800 square foot leachfield is located in the Malibu Creek hydrologic subarea of the Malibu hydrologic Unit Quarterly monitoring reports submitted to the Regional Water Quality Control Board contain the average and maximum discharge per month. Semi-annually, the discharger is required to sample nitrate from upgradient and downgradient ground water monitoring wells (RWQCB, 1990e).

¹⁰ Cross Creek Shopping Center has submitted groundwater monitoring reports to the Regional Board They are monitoring at least 3 groundwater wells for depth to water and volatile organic chemicals (in order to test for contamination from a dry cleaner) The October report states that "analysis of the depth to groundwater data collected at CCSC [Cross Creek Shopping Center] suggests that the groundwater in the area of Colony Cleaners is influenced by tidal fluctuations in Malibu Lagoon" (Cross Creek Shopping Center, 1993)

Malibu Media Center, Albert Winnikoff, owner, Waste Discharge Requirements, Order No. 91-022, CI 7021, finalized December 26, 1990.

Albert Winnikoff is building the Malibu Media Center at the Cross Creek area at 22483 Pacific Coast Highway. The site was still under construction when it was inspected by the Regional Water Quality Control Board on 3/22/92. The project, a 5300 square foot commercial building, is projected to discharge up to 6000 gallons per day of domestic waste to a septic tank leachfield in the Monte Nido hydrosunit of the Malibu hydrologic unit. The collection system has been designed so that it can be connected to a public sewer system if one becomes available. The discharger is required to install a sample box in the line at a point before the inflow to the leachfield. Quarterly monitoring reports must be submitted with information about average daily discharge quantity and any seepages from the system (RWQCB, 1990a).

Karen Martin, Natural Science Division, Pepperdine University, Ongoing Studies

Karen Martin, a biology professor at Pepperdine University, has several ongoing studies of intertidal aquatic organisms in the Malibu area. She studies sculpin fish and has sampling stations along Malibu Road and along the Pacific Coast Highway. Although the focus of her studies is on adaptations to the intertidal environment, future studies may include the effects of contaminants. In addition, her students have completed projects on shore crabs and sea anemones at Leo Carrillo State Beach. Her research is funded by a National Science Foundation/Research Experience for Undergraduate Students grant and a Santa Monica Bay Restoration Project PIE Grant (Martin, 1992).

State Farm Mutual Automobile Insurance Company, NPDES No. CA0053112, CI 5842, finalized August 22, 1983

The State Farm Mutual Automobile Insurance Company, an office building, discharges up to 5000 gallons per day (according to their NPDES permit) of bleed-off water from a cooling tower. The waste water flows to a storm drain along Agoura Road and thence on to Westlake Lake. The discharger is required to submit quarterly reports to the Regional Water Quality Control Board containing information about chemical additives, and results from discharge samples including total waste flow, pH, temperature, total dissolved solids, chromium, and pentachlorophenol. The discharge must submit annual reports including suspended solids, settleable solids, BOD, and oil and grease (RWQCB, 1983). In recent years, the discharger has consistently exceeded the flow limits (15,340 gallons per day in third quarter 1992, for example) and has exceeded Basin Plan limits for chloride (State Farm, 1992).

Surfrider Foundation-Blue Waters Task Force, Citizen Monitoring Program

In 1990, the Surfrider Foundation initiated a two year, citizen volunteer "Blue Waters Task Force" monitoring program. The program was started in response to a perceived lack of nation-wide coastal water sampling by governmental agencies. Locally, the overall goal of the program is to increase public awareness of pollution issues in the Santa Monica Bay.

To report observed water pollution occurrences, Surfrider Foundation established an 800 number (1-800-743-SURF). In addition, individuals who wish to participate in monitoring, purchase a small lab membrane fermentation or multiple tube fermentation kit for \$2 to sample for coliform densities in ocean and other waters. From October, 1990, to August, 1991, twenty different beaches in California and Hawaii were tested, including Malibu Lagoon. At the end of the program, Surfriders will publish a summary report (Saltman, 1992, Surfrider Foundation, 1991; San Jose Mercury News, 1993).

Tim Thomas, private individual, rain gauge data collection

Tim Thomas, a private individual, has been collecting data from a rain gauge located at Stunt Ranch since 1978. The property including the rain gauge area will eventually become part of the University of California

Natural Reserve System (Thomas, 1993) The buildings at this location was burned in the Topanga fire of November 1993.

Topanga-Las Virgenes Resource Conservation District

The Topanga-Las Virgenes Resource Conservation District started monitoring Malibu Lagoon before 1987. Initially, the monitoring consisted of salinity measurements as an educational experience for school children in the marine science program at the District. In 1987, the District received State and County grants to perform a Baseline Ecological Survey (TLVRCD, 1989). The study included monitoring of water quality, aquatic life, birds, vegetation, and sediment in the Malibu Lagoon. This monitoring effort was further funded during a subsequent grant program which focused on reintroducing the tidewater goby to the lagoon (TLVRCD, 1993a and 1993b)¹¹ Currently, the District is continuing the monitoring of the lagoon under an USEPA Near Coastal Waters Program¹² grant to restore the western bank of the Malibu Creek/Lagoon (TLVRCD, in progress). A \$85,000 grant from the California Coastal Conservancy (see details in Proposed Projects below) is planned for restoration/study of the Malibu Lagoon. During hiatuses between grants, the District maintains a continuous, but reduced, monitoring program.

The goal of the Resource Conservation District is to increase the amount and quality of habitat in the Malibu Creek/Lagoon system. An integral part of their efforts is the monitoring program. For the monitoring program, the District maintains 8 sampling stations (figure 5). The sampling station locations were chosen to give a comprehensive, overall picture of the lagoon from the upper reaches to the mouth. The District monitors those parameters which indicate habitat quality necessary for survival of aquatic species.

Current monitoring (to continue at least until 1994) under the USEPA Near Coastal Waters Program, includes quarterly photographic and written documentation of vegetation, quarterly seines for aquatic organisms, and weekly recording of physical parameters. Staff scientists use a lab kit and other instruments (Yellow Springs Inst. model 057 meter [measures temperature and dissolved oxygen], Atago refractometer) for the field sampling. The sampling is on a fixed schedule, but there is some flexibility if it rains (i.e., postponing fish collection). Although they have a written field protocol and quality assurance plan, they do not perform duplicate sampling in the field.

Data are maintained in a Lotus spreadsheet and are available to the public upon request. The public can also obtain copies of quarterly and final reports. Staff uses the data to make recommendations about how to manage biodiversity within the lagoon. The District works closely with the State Department of Parks and Recreation (they have funded several grants) and data are sent to the Parks Department as well as the USEPA. The District has not yet coordinated their monitoring (which may duplicate) with Tapia's enhanced monitoring program. They plan to coordinate.

Costs of the District's monitoring program (for 1993) were \$150 for lab kit supplies and \$4160 for personnel costs. When funding becomes limited (i.e., between grants), the number of sampling parameters are reduced, but the total number of stations and the fish seining activities are maintained (Manion, 1992).

¹¹ The Tidewater goby was recently listed on the federal endangered species list (Los Angeles Times, 1994b)

¹²CALTRANS was scheduled to remove fill from the restoration area in June of 1993. This work was postponed to June of 1994 because of the construction related to the new Pacific Coast Highway Bridge over the Malibu Lagoon. Therefore, planning and monitoring aspects of the workplan for the Near Coastal Waters grant have been postponed to June 1994 (USEPA, 1993)

Ventura County Public Works Agency

The Ventura County¹³ Public Works Agency maintains records from groundwater wells, stream gauges and rain gauges in the upper Malibu Creek watershed. Two to three hundred key wells in Ventura County are sampled annually by the Agency. Other wells are sampled on an occasional basis. There is not much water storage capability in the Malibu Creek watershed, so it is not considered a key area, and thus is sampled only minimally. In the Malibu Creek Watershed, about 11 wells have infrequent water quality or water level records since at least as far back as 1973. One well, in Hidden Valley, has been sampled regularly in recent years for general minerals and nitrates.

Occasional surface water samples have been analyzed from Lake Sherwood and from Hidden Valley Creek. The Agency also maintains flow records from a Bristol Crest type stream gauge located just south of Lake Sherwood on Potrero Creek. The peak flow records date back to 1969 and are checked monthly. An automatic and a standard rain gauge located at a county fire station near Lake Sherwood (VC 121) has monthly records dating back to 1935. In addition, precipitation data have been collected at the Thousand Oaks Weather Station (VC 169) since 1957. Evaporation pan data at that station date back to 1970. Data collected from rain gauges, evaporation pans, streamflow and water quality stations are included in regularly published *Quadrennial Reports of Hydrologic Data* (Hoffman, 1992; VCPWA, 1986).

Westlake Lake Management Association

The Westlake Lake Management Association performs lab kit monitoring of Westlake Lake. They have records for the past eight year of pH and nitrate levels in the lake (Westlake Village, 1992).

AGENCIES THAT DO NOT MONITOR REGULARLY IN MALIBU CREEK WATERSHED

California Department of Fish and Game

The California Department of Fish and Game does not maintain any separate, regular, monitoring programs in the Malibu Creek watershed. They do, however, implement the Regional Water Quality Control Board's Mussel Watch, Toxic Substances Monitoring and Streambed Alteration Agreement programs. In addition, they periodically inspect the wild trout in Malibu Creek below Rindge Dam. In general, the ongoing role of the Department in the watershed includes review of permits and response to spills (Nitsos, 1992, Maxwell, 1992).

California Department of Water Resources

The California Department of Water Resources has sampled stations in the Malibu Creek watershed in the past but does not currently monitor in the watershed.

CALTRANS

CALTRANS does not have a monitoring program along the Pacific coast Highway in the Malibu area. CALTRANS, however, is a co-permittee of the Municipal NPDES permit under the LA County Department of Public Works.

¹³ Ventura County will be regulated under a NPDES Municipal Storm Water permit that was adopted by the Regional Board in the summer of 1994. See the section under the Los Angeles County Department of Public Works for general information about NPDES Storm Water permits.

City of Agoura Hills

The City of Agoura Hills does not have a monitoring program. The City has an erosion control ordinance. Several service stations in the city have had tank removals and have put in monitoring wells.

City of Calabasas

The City of Calabasas does not perform any regular monitoring. They do, however, require that new developments meet NPDES nonpoint source requirements, including filtration devices, for control of on-site discharge.

City of Hidden Hills

The City of Hidden Hills does not have a monitoring program. The building inspector does, however, check for compliance with their erosion control ordinances

City of Malibu

The City of Malibu¹⁴ does not perform regular monitoring. The City has, however, commissioned a series of studies by Peter Williams et al. to look at various water management options and one of the studies may involve some monitoring (see below).

City of Thousand Oaks

Most of Thousand Oaks¹⁵ does not drain into the Malibu Creek watershed and therefore, they do not have any monitoring in the watershed. The sewerage agency for Thousand Oaks is Triunfo Sanitation District (see above)

Southern California Coastal Water Research Project

The Southern California Coastal Water Research Project does not perform any monitoring activities in the Malibu Creek Watershed.

United States Army Corps of Engineers

The Army Corps of Engineers does not regularly monitor in the Malibu Creek watershed. They do not have jurisdiction over the four dams in the area. The Corps does, however, have copies of Los Angeles County Beaches and Harbors' beach profiles from 1935 to 1953 from Point Dume to Torrance, the Corp's 1961 beach profiles from Malibu Creek to Ballona Creek and the Corp's 1949 profiles from Point Dume to Topanga (Schwichtenberg, 1992)

¹⁴ The City of Malibu has recently developed a General Plan that includes adoption of water quality standards, protection of natural conditions including gravel streambeds supporting steelhead trout, collecting baseline data for the Malibu Coast and the Malibu Lagoon (Malibu, 1993)

¹⁵ The City of Thousand Oaks has submitted an application for a separate Municipal Storm Water NPDES permit to the Regional Board for the portion of the city that drains to the Santa Monica Bay (i.e., that is part of the Malibu Creek watershed) (RWQCB, 1993)b

United States Bureau of Reclamation

The United States Bureau of Reclamation installed old stream gauges under contract to the USGS. The USGS now maintains those gauges.

United States Department of the Interior, Fish and Wildlife Service

The United States Fish and Wildlife Service does not perform any regular monitoring in the Malibu Creek watershed. On occasion, in conjunction with California Department of Fish and Game, they have surveyed the steelhead trout in the creek (Hanlon, 1992)

United States Geological Survey

Although they have an established station in the Malibu Creek watershed, the United States Geological Survey (USGS) does not currently collect data from that monitoring station. The station is "Malibu Creek below Cold Creek." The USGS has done special studies in the past in the watershed and maintains an extensive database of all of their past and current sampling data from those studies (Bader, 1993)

Santa Monica Mountains Enforcement Task Force

In 1990, the Santa Monica Mountains Enforcement Task Force was created from federal, state and local regulatory agencies to help reduce illegal development. The Task Force relies on public complaints to detect and take action against illegal developments

Santa Monica Mountains Conservancy

The Santa Monica Mountains Conservancy does not perform monitoring.

CURRENT SPECIAL STUDIES OR SHORT TERM MONITORING PROJECTS

California Department of Fish and Game, Geological Exploration and Removal of Sediment Behind Rindge Dam

The California Department of Fish and Game¹⁶ is studying the sediment behind Rindge Dam. Rindge Dam was built in 1924-25 and was declared non-jurisdictional by the State in 1967 after it had mostly filled with silt. The sediment is being investigated to see if it can be used for construction or for beach replenishment purposes. In late spring, 1993, a 24-hour drawdown test using two installed groundwater wells was performed. Five cores of sediment (3 near dam, 2 upstream) was sampled for USEPA priority pollutants. The approximate cost of the project was \$60,000 (Allan, 1992).

¹⁶ The geotechnical report is finished (CDFG, 1994) and concludes that the sediments behind the dam are clean enough for removal. An engineering/financial study to examine the options for the removal of the dam, including the option of no removal, is planned for completion in the summer of 1994 and will be financed by the Bureau of Reclamation. Funds for removal of the sediment and dam are still being sought (Bureau of Reclamation has budgeted \$500,000 for engineering analysis but requires a 50% cost match).

Soil Conservation Service-Natural Resources Plan for the Malibu Creek Watershed

The Soil Conservation Service (SCS)¹⁷, in conjunction with the Topanga-Las Virgenes Resource Conservation District and the Santa Monica Bay Restoration Project, is undertaking a two year project to study, in detail, the Malibu Creek Watershed. The study will involve analysis of hydrology, soils, water quality and quantity problems, natural resources, erosion and soil problems and biological integrity. The SCS will evaluate problems and present alternative measures to address those problems, as well as identify possible implementing strategies and funding sources. The project will result in a written report with maps. The SCS will

¹⁷ Due to the Green Meadows, the Old Topanga and other fires in southern California in the fall of 1993, the SCS fell behind on the schedule for the Natural Resource Plan.

During 1993 and early 1994, the Advisory and Executive Committees met on a regular basis to discuss the Natural Resource Plan and to discuss issues of concern in the watershed, including the aftermath of the Old Topanga and Green Meadows Fires (October-November 1993). In addition, four subcommittees met regularly: i) Fish and Wildlife/Geology/Geography/modeling and Monitoring, ii) Land use/Cultural Resources/Implementation/Ordinances, iii) Media/Community Involvement/Public Education, and iv) Public Health and Recreation.

The Monitoring and Modeling Subcommittee of the Natural Resources Plan Advisory Board is planning a technical workshop in the spring of 1995. This workshop will bring together local experts to debate and devise a set of endpoints or goals for monitoring programs. One example is the ideal range of pH that would support native biodiversity in the Malibu Lagoon.

In addition, the Santa Monica Bay Restoration Project and the Topanga-Las Virgenes Resource Conservation District co-sponsored a series of 8 meetings (many of which were two day meetings) to which all stakeholders in the watershed were invited. Professional facilitators were hired to mediate the discussions. These facilitated meetings for the Comprehensive Malibu Creek Watershed Plan involved coming to agreement on a set of 111 recommendations that all of the stakeholders in the discussions could agree to by consensus. Many recommendations were eliminated in the process based on the statement by one or more groups that their organizations mandate would not allow such a recommendation.

The 111 recommendations or "action goals" include several that involve long or short term monitoring or response protocols (the numbers in italics indicate the number assigned on the Action Goal List) (Bivol-Padva and Greenwood, 1994).

- 3* Implement dye study of the septic systems in the vicinity of the lagoon, creek and surfzone
- 4* Identify and eliminate or reduce, by sub-watershed area, sources of harmful pathogens, toxic chemicals, sediments, and nutrients
- 9* Conduct a thorough and definitive study of lagoon water quality, identify all pollution sources in study and develop remediation
- 11* Use appropriate testing techniques to determine the presence of pathogens and test for compliance with established standards
- 12* Develop receiving water quality objectives that protect designated beneficial uses of the watershed, creek, lagoon, and near shore (Receiving water quality objectives include nutrients, pathogens, sediments, toxics, pH, DO and more)
- 14* Determine and establish achievable nutrient standards to maintain natural populations
- 24* Implement pathogen testing when and where bacteria counts are high.
- 30* Develop and implement coordinated and integrated watershed monitoring program
- 32* Conduct survey of existing locations and amounts of animal waste within the watershed
- 43* Allow historical seasonal sediment flow to beaches
- 61* Develop a comprehensive picture of the hydrology, circulation, the biota of the lower creek and lagoon and surfzone for policy decision-making
- 76* Develop effective means to enforce pollutant reduction programs
- 77* Create and implement a regional and subwatershed approach to the coordination of land use and water quality decisions
- 97* Create a centralized database of water quality and resource data accessible to all parties
- 98* Develop a coordinated GIS Database network which is accessible to all parties.
- 100* Expand an understanding of the hydrology of the watershed and near-shore bathymetry
- 101* Calabasas Landfill to install monitoring wells which they were directed to construct in February 1990 and report results of findings to advisory committee
- 105* Perform quarterly toxic chemical tests in Malibu Lagoon and surfzone
- 106* Expand the understanding of the impact of Calabasas Landfill on water quality
- 111* Establish a Total Maximum Daily Load model for all inputs to watershed

not be performing extensive field work but will rely heavily on literature research, previously acquired monitoring reports and interviews with individuals in the watershed (USDA-SCS, 1992).

PROPOSED SPECIAL STUDIES OR MONITORING PROJECTS

Proposal: Santa Monica Bay Restoration Project, 1992 (September 16), Study Design to Investigate the Potential Health Effects of Recreational Exposure to Storm Drain Runoff in the Santa Monica Bay, report submitted by Haile, R., Greenland, S., Millikan, R., and Witte, J.

This is a proposed \$1,150,000 study of the ill health effects of bathing in Santa Monica Bay and the risk associated with urban runoff in storm drains. 10,000 recreating individuals would be surveyed at two beaches (follow-up at 3-4 days and at 10 days) for gastrointestinal or other illnesses potentially related to the water exposure. The water at those beaches would also be tested concurrently. Malibu Creek is one of the potential beaches to be included in the study (SMBRP, 1992a and 1994a).

Proposal: Santa Monica Bay Restoration Project, 1992 (October), Draft Surface Drainage Water Quality Monitoring Program Plan, report submitted by Woodward-Clyde Consultants.

The Santa Monica Bay Restoration Project has initiated an assessment of urban runoff pollution in the Santa Monica Bay drainage area. The second part of the effort includes a proposed monitoring plan of the quality of coastal storm drain discharges into the Bay. The Consultants (Woodward-Clyde) have proposed the placement of a continuous flow monitoring station for two years at Malibu Creek, as well as 3 other major drains or creeks, in order to determine the mass emissions to Santa Monica Bay. It should be noted that some of these stations may be dry for part of the year. Grab and composite samples would be collected 4 to 6 times per year and eight storm samples would be collected during the two years of the study. Samples would be analyzed for conventional pollutants, nutrients, bacteria, metals, organic chemicals, and pesticides. Twelve additional stations are proposed to monitor land-use and pollutant runoff characteristics. This report also recommends that Malibu Lagoon be monitored during storm events (SMBRP, 1992c).

California Coastal Conservancy/Topanga-Las Virgenes Resource Conservation District Restoration Project of Malibu Lagoon

The California Coastal Conservancy¹⁸ has provided \$85,000 to the Topanga-Las Virgenes Resource Conservation District for restoration/study of Malibu Lagoon. The plan includes a historical study of lagoon, preparing selected biological water quality objectives for nutrients, preparing a comprehensive picture of hydrology and biota of lower creek and lagoon, assessing the effects of breaching the lagoon and developing a conceptual habitat restoration plan. The project will involve gathering field generated data, augmented with data from other sources (CSCC and TLVRCD, 1992; McIver, 1992).

COMPLETED SPECIAL STUDIES OR SHORT TERM MONITORING PROJECTS

California Department of Water Resources

Although the California Department of Water Resources no longer monitors regularly in the Malibu Creek watershed, they do have data on microfiche from previous monitoring efforts at the following stations:

Malibu Creek at Cross Creek
Malibu Creek below Cold Creek
Malibu Lake

California Regional Water Quality Control Board: Basin Plan Update Program-Investigative Lakes Study

The Investigative Lakes Study was funded by Basin Planning funds through the State Water Resources Control Board and administered by the Regional Water Quality Control Board. The study was conducted by researchers at University of California, Riverside. The contract ran from March 27, 1992 through November 1993, and included one year of monitoring. The overall goal was to assess the water quality, seasonal variation, toxic status and the trophic condition of rural and urban lakes in California. The objectives included establishing site-specific water quality objectives, assessing a list of toxic substances which exceed allowable levels, determining the trophic status of each lake, and identifying protection and remediation programs. A final report with maps was produced.

¹⁸ The implementation of this grant has been delayed by various factors including the building of a new Pacific Coast Highway bridge over the Lagoon by CALTRANS. The bridge and accessory utility line are being built during the summer and fall months (June 1 to December 1) from 1993 through 1996. There has been some controversy over whether the restoration work can or should include a bathymetric study of the near-shore surf zone. Surfer groups feel that a baseline study is needed in order to determine Lagoon water level management options (i.e., whether to breach or not, and if so, where).

An additional amount of \$50,000 has been added to this grant as part of a settlement with Chevron Corp. Chevron is paying more than \$500,000 as part of a settlement agreement for a March 1991 oil spill in Santa Monica Bay. Money other than the \$50,000 for the Malibu Lagoon restoration project, will be used for other environmental projects including an epidemiological study (BNA California, 1993). The pilot epidemiologic study examining the potential health effects of recreational exposure to storm drain runoff in Santa Monica Bay was completed in early 1994 (SMBRP, 1994a).

The Resource Conservation District has completed a detailed workplan for the grant and has received comments from the public (RCD, 1993). The tasks in the June 30, 1993 draft are:

- 1 Hydrologic evaluation of lower Malibu Creek and Malibu Lagoon
- 2 Define biological and water quality objectives
- 3 Biota of lower Malibu Creek and Lagoon
- 4 Assess the effects of sandbar breaching on biota
- 5 Historical reconstruction of Malibu Lagoon and adjacent areas with a comparison to analogous lagoon systems
- 6 Develop conceptual habitat restoration options
- 7 Develop options, including conceptual designs, for managing the water level in the lagoon

Out of 26 lakes targeted in the region, 5 were within the Malibu Creek watershed (Lake Eleanor was dropped from study due to inaccessibility and inability to catch fish, the lake was included for historical data only) Malibu Lake, Lake Lindero, Lake Calabasas, Westlake Lake, and Lake Sherwood. The lakes were selected on the basis of size and frequency of recreational use.

The lakes were sampled monthly for general minerals, volatile organic chemicals, metals, and pesticides. Visual inspections included physical properties of water quality and lake morphology, lake use and lake accessibility. The cost of the program for the region was \$210,000. In addition, special Toxic Substances Monitoring (TSM) (program described above) of fish from the same lakes was performed for spring, 1991, and spring, 1992, at a cost of approximately \$8900 per year. Other sampling (1992-93?) involving lakes were part of the regular TSM program, under this program, fish tissues were analyzed for organic chemicals and metals (Rubalcava, 1992; RWQCB, 1992d)

California Regional Water Quality Control Board: Basin Plan Update Program-Beneficial Use Study

As part of the Regional Water Quality Control Board's Water Quality Control Plan (Basin Plan) update, a Beneficial Use Study (contract terminated in June, 1993) was undertaken. The contractor, California State University, Fullerton, conducted field studies/beneficial use evaluations of all regional waterbodies for inclusion in the Basin Plan update. These studies included general field observations, temperature, pH and conductivity for most sites (Smith, 1992)

California Regional Water Quality Control Board, in prep., Intensive Surveys of the Malibu Creek watershed

An interagency team led by the Los Angeles Regional Water Quality Control Board has performed two Intensive Surveys of the Malibu Creek Watershed. The first Intensive Survey was performed in May during a moderate flow regime. A second survey was performed on September 28, 1993 during low flow conditions. Intensive surveys are extensively used in other states and provide data for determination of a wasteload allocation for a waterbody. The surveys provide data for the Soil Conservation Service modeling efforts and for future modeling efforts to assess nonpoint source loadings in the watershed. Seventeen stations in the watershed were sampled twice during the day, at the same time at all points. Field temperature and flow were determined. Parameters which were collected for laboratory analysis included: general minerals, pH, nutrients, coliform, metals, turbidity, and total suspended solids. In between sampling events, participants surveyed and mapped the land use and stream bed condition in the areas adjacent to their sampling site. Mapping included habitat assessment, sediment deposition and erosion, vegetation, land use, and amount and type of debris.

The second sampling event was a joint effort of many federal, state, county, local agencies/districts, and environmental groups and is an excellent example of the interactive success of the ongoing Malibu Creek watershed Planning Group. The agencies that contributed laboratory funding *and/or* staff were: Los Angeles County Department of Public Works, Las Virgenes Municipal Water District, and the Regional Water Quality Control Board. Other groups or agencies that contributed staff for the sampling/mapping project were: USDA Soil Conservation Service, National Park Service, Santa Monica Bay Restoration Project, Heal the Bay, Los Angeles County Supervisor Ed Edelman's office, and Organic Solutions, Inc. The Topanga Las Virgenes Resource Conservation District contributed staff and organized a group of volunteers from the local community.

A third survey is planned for the first major storm of the fall of 1994. Environment Now has provided a grant of \$10,000 to support the lab costs.

California Regional Water Quality Control Board, in prep., Malibu Lagoon Coliform and Nutrient Study, Shirley Birosik.

The Regional Water Quality Control Board sampled the Malibu Lagoon during 1989-90 for nutrients and coliform as part of a study to determine the effects of influx of local and upstream contaminants and effluent on beneficial uses of the lagoon. Seven stations which correlate to Topanga-Las Virgenes Resource Conservation

District sampling locations were sampled for total and fecal coliform, nitrates and phosphates, at an approximate cost of \$12,000. Twelve samples collected from October, 1989, to May, 1990, showed spatial and temporal variability in bacteria and nutrient levels that may be partly seasonal in origin (especially with regard to wet weather versus dry weather) (Birosik, 1992; RWQCB, 1990b).

California Regional Water Quality Control Board, in prep., Malibu Lagoon Storm Water study, Shirley Birosik.

The Malibu Lagoon Storm Water Study involved sampling stations in the lagoon and runoff from stormdrains into the lagoon after storms. The study showed that, after storms, metal levels were high in storm drain runoff but not in middle of the lagoon or in other areas remote from the drains. Total petroleum hydrocarbon analyses were also performed. One conclusion of the study is that the volume of water in the lagoon can absorb some urban runoff pollutants (Birosik, 1992).

California Regional Water Quality Control Board, in prep., Old Topanga Fire Water Quality Nutrient Study

The Regional Water Quality Control Board conducted a study of the Cold Creek area after the Old Topanga Fire of November 2, 1993. With assistance from a community volunteer and the Las Virgenes Municipal Water District-Tapia Laboratory, samples were taken before soon after the fire, before any major storms, and during two major storms. Samples (6) from Cold Creek above and below the burn zone and from Malibu Creek were analyzed for nutrients and PAH.

California Regional Water Quality Control Board, Waste Discharge Requirements or NPDES permits which are rescinded or were not investigated in this study:

Rancho Pet Kennels, 27201 Ventura Blvd, Agoura, CI 6418, Los Angeles County permit. Dog kennel washdown which is discharged into a leachfield.

MOT Industries, Inc, Calabasas Estates Sewage Treatment Plant, north of Cold Creek, Waste discharge Requirements 4B191133001. Possibly these Requirements were never enacted.

Mobil Oil Corp, 4950 N. Reyes Adobe Rd, rescinded Waste Discharge Requirements 4B192215001, CI 5844. Wash sump discharged to leach field.

Memorex Corp, Unisys Corp, Westlake Facility, 5411 N. Lindero Canyon Rd., rescinded NPDES permit 0055697, CI 6723. Tank leak remediation (?) discharged into Lindero Canyon Channel.

California Trout

California Trout (CalTrout) began an investigation eight years ago of the steelhead trout in Malibu Creek. Prior to the monitoring efforts of CalTrout, there was no proof that steelhead trout currently exist in Malibu Creek; old reports from the 1940's document steelhead in the creek. CalTrout built a \$15,000 weir in the creek, and volunteers monitored the trout migration on weekends (included photo documentation). After they verified the trout run, CalTrout obtained a grant from the Santa Monica Mountains Conservancy to continue the verification effort and to investigate the possibility of improving the quantity of habitat (see Trihey and others below). Currently, Caltrout's role is to husband and advocate the efforts of the Department of Fish and Game to attempt to remove the barrier of Rindge dam to trout migration (Edmondson, 1993).

California Trout, 1989 (May) Malibu Creek Steelhead Habitat Assessment. Prepared by Franklin, R. and Dobush, S., ENTRIX. Inc.

The Santa Monica Mountains Conservancy awarded a \$121,000 grant to California Trout towards a steelhead restoration project at Malibu Creek and the tributary Cold Creek. \$28,460 was used for research about the quality and quantity of the steelhead habitats and the benefits of restoration for the trout. The report discusses

the four barriers which obstruct upstream migration and includes designs of facilities to allow migration around the barriers.

The study involved a survey of steelhead rearing and spawning habitats along Malibu Creek and Cold Creek. At different sites along 20 kilometers of the creek, the average water velocity, average water depth were measured and the sediment size, percent embeddedness of substrate and quality of escape cover and resting pools were assessed. Five stream reaches on Malibu Creek and Cold Creek are described in detail in the report (including air and water temperature, discharge, geomorphology, vegetation, aquatic macroinvertebrates, insects, and general comments about water quality). The report notes the serious amount of degradation of habitat quality just below the Tapia Water Treatment Plant (foam, lack of attached algae, acrid odor, lack of macroinvertebrates) (CalTrout, 1989b).

California Trout, 1990 (March), Synopsis of 1989 Temperature Data from Malibu Creek, California. report prepared by Trihey and Associates.

Trihey and Associates, under contract to CalTrout, measured water and air temperature in Malibu Creek at Century Ranch, above and below the Tapia Water Treatment Plant and below Rindge Dam. They used semi-permanent recorders that monitored temperatures bi-hourly during July and August, 1989. The study concluded that the water temperature (and fluctuations) were representative of typical stream temperatures (CalTrout, 1990).

California Trout, 1994 (June) Characteristics of Pool Channel Form and Surficial Fine Sediment Over Time: Malibu Creek, Los Angeles County. Prepared by A. Spina and D. Tormey, ENTRIX, Inc.

The Santa Monica Mountains Conservancy awarded a grant to California Trout to investigate sedimentation in Malibu Creek following the Old Topanga and Malibu Fires of October, 1993. Pools and channels were monitored from January to April, 1994. The researchers concluded that sediment accumulations likely displaced juvenile salmon from upstream holding areas to downstream areas and that the earthquake (January 17, 1994; 6.8 earthquake) contributed beneficial gravel (CalTrout, 1994).

Flowers, E. S., 1972, Measurement and Management Aspects of Water Toxicology: The Malibu Watershed, a mixed residential and Wilderness area.

Flowers (1972) conducted a wide ranging study which included water quality surveys, terrain descriptions and surface flow evaluations of the Malibu Creek Watershed. Thirty nine surface water sampling stations (wells, ponds, creeks, and lakes) were sampled for general minerals from July to September, 1971. This report contains descriptions of geology and topography of the watershed and includes locations of feeder springs and seepage areas (see figure 3 above). Mercury was analyzed in tissue of specimens of Arroyo Chub, *Gila orcutti*, collected at Malibu lagoon, at Cross Creek Road and at Tapia County Park (Flowers, 1972).

Los Angeles County Agricultural Commissioner

The Los Angeles County Agricultural Commissioner office ran a surface water quality monitoring program from approximately 1974 to 1986. Up to 400 samples in LA County, including the Malibu area, from lakes, streams, and drains were analyzed for pesticides. The program was terminated due to budgetary constraints. Unfortunately, the data were archived and are difficult to access now. If an agency could provide funds, then staff would be able to retrieve the data (some of the data might be on computer) (Makos, 1992).

Malibu, City of, 1992 (March), Malibu Wastewater Management Study: A Human Ecology of the New City. Study prepared by Philip Williams and Associates, Ltd., and Peter Warshall and Associates.

This study, commissioned by the City of Malibu, included a preliminary investigation into alleged malfunctioning septic tanks leaking contaminating ground water near Malibu Lagoon and about wastewater management in general in the City of Malibu. While they acknowledge that more detailed studies are needed in the Malibu Lagoon (study of algal blooms, nutrients, circulation, source of possible viruses and pathogens), they concluded that the septic tanks near the lagoon are not causing a problem. They did not perform dye tests in the Malibu Lagoon area. Their bore tests showed interlayering of silts, clays and sands in the Malibu Colony area that they state should help dispose of bacteria and viruses (Philip Williams, et. al., 1992).

National Park Service, Santa Monica Mountains National Recreation Area, 1981 (May 1), A Hydrologic Evaluation of Medea Creek, Paramount Ranch, Medea Creek fecal coliform. Study by Paul W. Rose, Resource Management.

In this report, the Medea Creek hydrologic area was described, cross sections were prepared and 25 year frequency storm discharge rates were calculated (NPS, 1981b).

National Park Service, Santa Monica Mountains National Recreation Area, 1981-1984, Medea Creek Coliform Study.

In 1981, high coliform levels were detected in Medea Creek, leading to a special study by the National Park Service to determine the potential source of the pollution. Water samples were analyzed for nitrate, nitrite, phosphate, MBAs and bacteria. The study concluded that wildlife was responsible for the high coliform counts, and the area was posted with human health warnings (NPS, 1981-1984).

Santa Monica Bay Restoration Project, 1990, Storm Drain-Catch Basin Project.

This study comprised a questionnaire which was sent to cities and agencies that own catch basins in the Santa Monica Bay Watershed area. The cities were questioned about their frequency of catch basin and street cleaning, method of quantifying removed material, inspection method, and type of public education. In the Malibu Creek Watershed the following cities or agencies monitor catch basins (SMBRP, 1990).

<u>City</u>	<u>Identifies problems in Catch basins</u>	<u>Inspects Catch Basins</u>
Agoura Hills	Yes	No
Caltrans	Yes	Yes (yearly)
Los Angeles DPW	Yes	Yes
Westlake Village	No	No

Santa Monica Bay Restoration Project, 1992, Pathogens and Indicators in Storm Drains within the Santa Monica Bay Watershed. A technical study by Gold, M., Bartlett, M., McGee, C., Deets, G.

This Santa Monica Bay Restoration Project pathogen study focused on the presence of indicator bacteria and human enteric viruses at Pico-Kenter and Herondo storm drains and Malibu Lagoon. Samples at four locations within Malibu Lagoon, collected over a period of 6 months, were analyzed for total and fecal coliform, enterococci, F-male specific coliphage, and human enteric viruses (at three of the four sites). Conductivity, temperature, water height, and pH were measured in situ.

Sample locations within the Lagoon were:

- 1) Breach location near mouth of Lagoon,
- 2) Bridge over C-channel (western-most channel),
- 3) Just east of Pacific Coast Highway; and
- 4) In Creek, 100 yards north of station 3.

Coxsackie B virus was identified in the Malibu lagoon samples. The authors recommend that a more sophisticated indicator is needed for sampling of human pathogens and further study is needed to determine the source of viruses, bacteria and other pollutants (SMBRP, 1992e).

Texaco Service Station Remediation Project, NPDES Permit CA0060828 CI 6962 finalized 8/6/90

A Texaco Station located at 23387 Pacific Coast Highway, discharged up to 360,000 gallons of treated ground water from a mitigation project, from January 1990 to 1992 (for a leak of gasoline from a product line that occurred in 1980). Texaco submitted a final report for review by the Regional Water Quality Control Board to determine if closure is warranted¹⁹.

During the remediation, the treated ground water was discharged through a storm drain to the Malibu Lagoon just above the Pacific Coast Highway bridge. A sampling station at the point of discharge was monitored weekly for flow, temperature, pH, oil and grease, lead, certain volatile organic chemicals and annually for toxicity. Texaco had previously conducted an on-site and off-site groundwater investigation which involved groundwater monitoring wells (RWQCB, 1990c)

Topanga-Las Virgenes Resource Conservation District, 1989, Malibu Lagoon: A Baseline Ecological Survey. Study conducted by B. Sean Manion and Jean H. Dillingham for Los Angeles County Department of Beaches and Harbors and California Department of Parks and Recreation.

The Topanga-Las Virgenes Resource Conservation District undertook an extensive survey of all wildlife, water quality, sediment and management aspects of the Malibu Lagoon. This report serves as a valuable and comprehensive starting point for future research about the lagoon (TLVRCD, 1989)

United States Geological Survey and the National Parks Service, Santa Monica Mountains National Recreation Area, Water resources Program, Division of Resources Management, 1982-1988?, Baseline Hydrologic Data Survey of Santa Monica Mountains National Recreation Area.

From 1982 to approximately 1988, a National Parks Service baseline hydrologic study was implemented by the United States Geological Survey. The goal was to provide data that could be used to manage the park's water in order to protect the ecosystem and to ensure clean water for the park's visitors. The study involved collecting an inventory of all surface waters within the park and sampling for general minerals, nutrients, metals, bacteria and organic chemicals semiannually (dry and wet seasons). Sampling stations within the Malibu Creek Watershed included: Malibu Lake, Medea Creek, Cold Creek, Malibu Creek below the Tapia Waste Water Treatment Plant, and Malibu Lagoon (these last two sites were sampled three times a year) Malibu Lagoon sediment was also analyzed for metals organic chemicals, and particle size distribution Stream flow data were also collected. Some of the stations were only sampled a few times and other changes occurred as the program evolved (NPS, 1981a; USGS, 1983).

¹⁹The Regional Water Quality Control Board has initiated the closure process (as of May 1994) Texaco did not discharge during 1993

According to Rose Rumball-Petre at the National Park Service, the sampling program was supposed to last ten years but was terminated early due to budget constraints. She knows of no final report and only has a set of unorganized files. She is currently reviewing the files and will prepare a summary report.

The United States Geologic Survey database includes the following stations (presumably from this study) and years of sampling data:

<u>Station</u>	<u>Dates</u>
Malibu Creek at Crater Camp (currently operated by DPW)	1981-1988
Cold Creek at Piuma Road near Monte Nido	1982-1988
Cold Creek tributary near Malibu Beach	unknown dates
Las Virgenes Creek at Mulholland Road near Brown Ranch	1988
Malibu Creek below Malibu Lake	1988
Malibu Creek at Cornell	1983-1987
Triunfo Creek at Mulholland	unknown date
Medea Creek at Paramount Ranch near Cornell	1982-1988
Malibu Creek at Lindero Rd near Westlake	1988
Medea Creek at Kanan Rd near Simi Peak	1988

Parameters range from conventional to metals, bacteria, and pesticides (Bader, 1993).

Westlake Village dump, Prudential, Waste Discharge Requirements issued by Regional Water Quality Control Board, Order No. 73-17

The Westlake Village disposal site for solid wastes is located about two miles upstream from Westlake Lake. These Requirements have now been rescinded. No groundwater monitoring was required in the permit. A SWAT investigation is underway and possible future remediation may be required (RWQCB, 1973)

COMPILATIONS OF MONITORING DATA

Regional Water Quality Control Board, Planning Division, Basin Plan Update database

The Regional Water Quality Control Board has recently compiled much of the surface water quality data for the Region for use in updating objectives for the Basin Plan. This data set is located on a Lotus spreadsheet program.

Santa Monica Bay Restoration Project, 1992, Assessment of Nonpoint Sources of Contaminants to Santa Monica Bay, Volume 1, Annual Pollutant Loadings to Santa Monica Bay from Storm Water Runoff, report prepared by Michael Stenstrom, University of California, Los Angeles.

Pollutant loads into Santa Monica Bay were estimated based on rainfall records, land uses, area of drainage basins, and water quality parameters from nine Agency's monitoring programs as well as the National Urban Runoff Program. Malibu Creek data at Cross Creek Road and at Salvation Army Camp stations were included in the study (SMBRP, 1992f).

Santa Monica Bay Restoration Project, 1991, Assessment of Monitoring and Data Management Needs in Santa Monica Bay: Final Report, submitted by Southern California Coastal Water Research Project, Long Beach, CA, and EcoAnalysis, Inc., Ojai, CA. by Thompson, B., Bernstein, B., Smith, R., and Packard, R.

This report includes an analysis of current monitoring programs in the Santa Monica Bay area, an outline of needs for improvements, and a proposal for a data and information management system that would form an integrated information network. The proposed system would have menu-driven query interface capabilities so that an individual, with no programming knowledge, at one location could easily access an index of data from all agencies. Interested individuals could then contact each agency directly for the actual data (SMBRP, 1991).

State Water Resources Control Board, STORET

STORET is a computerized national water quality database developed by USEPA. The California portion of the system is under the control of the State Water Resources Control Board and the database serves as a repository for water quality and other data collected by state and other agencies (CSWRCB, 1985). In talking with staff of various agencies, however, not all agencies contribute data to the system. Many persons, including both those who contribute and those that retrieve data, find STORET to be a cumbersome system to use that has sometimes questionable data quality.

National Park Service, Santa Monica Mountains National Recreation Area

The National Parks Service has developed an extensive Geographic Information System (GIS) for the Santa Monica Mountains. This GIS includes layers for streets and infrastructure, land use, topography, water quality, vegetation, etc., providing an overall resource management tool. This database will be available for interagency use. The Parks Service is also developing a Water Resources Management Plan for the Recreation Area (Malibu Surfside News, 1994 and Jenkins, 1993).

OPINIONS OF THE AGENCIES

Overall, the staff at the different agencies that monitor in the Malibu Creek watershed are trying to accomplish comprehensive and scientifically valid monitoring programs. The staff would like to help answer questions about human and ecosystem health issues but are generally limited by money and equipment constraints. Some of their opinions about the issues of concern are:

- ▣ One staff person said that he would like to put people's mind to rest about the pathogen problem. He feels that the public receives most of their information from newspapers and that those articles are not very accurate and contribute to public "hysteria about water quality." He would like to see continuous monitoring so that spill or other episodes would not be missed.
- ▣ Others would like to see more coordination of the monitoring in the watershed.
- ▣ One person said that, in general, better monitoring is occurring because of public demand. Ecologists have wanted to do more and now are getting more money. Several people said that if they had more money, they would like to do more monitoring to address problems that they are not covering.
- ▣ Another concern is about proprietary use of collected data in terms of publishing reports. Staff are concerned about the ethics and scientific problem of someone else publishing their data.
- ▣ A staff member at one of the major agencies said that he is frustrated because he feels like the data create more questions rather than answers.

- ▣ There is some feeling that the cities of the watershed need to take more responsibility in terms of special studies and monitoring.
- ▣ The Department of Health Services lab is currently operating at full capacity. If the Department had more money, they would like to monitor the station nearest the lagoon every time it is mechanically breached. They would like to lay the matter to rest (controversy about human health risks near the lagoon) by increased sampling or by special studies. In order to do this sampling, they would have to go to an outside lab and they do not have the funds (Petralia, 1992).
- ▣ The Department of Health Services staff feel that the Heal the Bay report card does a great disservice. It takes samples from around drains (a small % of the coast line) and extrapolates to the whole Santa Monica Bay. In addition, there is a problem with taking data from both 4 week- and 5 week-long months and comparing to California monthly standards (Petralia, 1992).
- ▣ In general, the Department of Health Sciences staff feels that because Los Angeles agencies test the beaches more frequently than other areas, there is the appearance of worse beaches in southern California than other parts of the country. No areas of California to the north or possibly areas on the east coast do as much comprehensive testing, and they might have more beach closures if they did (Petralia, 1992).
- ▣ Some staff at the agencies feel that enough data have been collected in certain areas and funds should be allocated for responses to recognized problems.

DISCUSSION

Agencies overall efforts

A substantial amount of monitoring occurs in the Malibu Creek watershed. These data, if accessible, will be important for the development of pollutant loading models in the upcoming Soil Conservation Service Natural Resources Plan study or in future studies. More work remains in making adjustments in the overall monitoring strategy for the watershed.

The Regional Water Quality Control Board runs four regular monitoring programs directly and oversees at least eight other monitoring programs (via NPDES or Waste Discharge Requirement permits) in the Malibu Creek watershed. The Board has not received the credit it deserves for this large amount of monitoring in the watershed in large part due to the lack of public relations. Many of the concerned individuals that were interviewed did not know about most of the Board's programs.

Summary of positive aspects of monitoring programs

Resources:

The different regional agencies have devoted a large amount of resources to the monitoring of the Malibu Creek watershed. As noted before, the Malibu area is a relatively small contributor to the southern California Bight, although a major contributor to the Santa Monica Bay.

Flexibility in Hyperion permit:

The Hyperion self-monitoring program is unique among the NPDES permitted programs in that it has flexibility built in order to reduce costs of monitoring for non-existent pollutants. Baseline monitoring in the first year and in the fourth year establish which pollutants are monitored in the regular monitoring program (NRC, 1990; RWQCB, 1987c).

Flexibility in Regional Water Quality Control Board's Programs:

The Regional Water Quality Control Board's Surface Water Program is flexible and able to change to examine new problems. The Toxic Substances and Mussel Watch programs also have flexibility to shift sites and to examine new ones. All of these programs, however, are hampered by restricted budgets.

Enhanced monitoring by LVMWD:

The enhanced monitoring program by the Las Virgenes Municipal Water District, which was negotiated with environmental groups, represents an improvement in monitoring in the watershed. Biological and pathogen issues that were not previously addressed are included.

Duplication as a cross check of the data:

The amount of overlap at the different stations (notably at Malibu Creek at Cross Creek - see Table 2) provides a method of cross-checking among the agencies. This cross-checking should be done by a follow-up study or on a regular basis by one of the agencies²⁰.

Santa Monica Bay Restoration Project recommendations for the Malibu Creek watershed: Previously stated general recommendations.

In October of 1992²¹, Santa Monica Bay Restoration Project adopted the following resolutions for Malibu Creek watershed:

- ▣ Conduct a source survey of major sources of pathogens from human wastes into the Malibu Lagoon;
- ▣ Improve the berm breaching protocol and beach closure protocol for Malibu Lagoon and environs;
- ▣ Improve monitoring protocol and notification procedures for the lagoon and surfzone;
- ▣ Encourage study of potential regrowth of pathogens in the lagoon and the need for improved water circulation; and
- ▣ Minimize dry-weather discharge into lagoon (SMBRP, 1992a).

The Project also adopted the following implementation goals:

- ▣ Conduct on-site septic tank inspection, improve septic tank surveillance and perform dye tests on septic tanks including the areas of Malibu Colony, Serra Retreat, Cross Creek Shopping Center, Hughes shopping Center, Malibu Lake, Monte Nido area and the community of Cold Creek;
- ▣ Identify ownership of various Malibu Lagoon storm drains,

²⁰ This concept has been approved as an Santa Monica Bay Restoration project protocol item.

²¹The Santa Monica Bay Restoration project released their Action Plan in April of 1994. This plan includes many actions for the entire Bay Drainage area that would include the Malibu Creek watershed (i.e., stronger implementation of requirements of the Municipal NPDES storm water permit). In addition, the plan devotes an entire chapter to 28 actions for the Malibu Creek watershed (SMBRP, 1994b). These actions overlap substantially with the 111 recommendations that are proposed as part of the Comprehensive Malibu Creek Watershed Plan described above in the Soil Conservation Service Natural Resources Plan section under Ongoing Projects.

- ☐ Conduct bacteriological monitoring and ammonia monitoring in several tributary storm drains to Malibu Lagoon, including Cold Creek Canyon, Winter Canyon and Perenchio Storm drains, and
- ☐ Improve monitoring of potential impacts from upstream urban runoff.

In addition, proposed in Santa Monica Bay Restoration Project, Draft Action Plan, Chapter 2 are the following.

- ☐ Establish a daily beach water quality reporting plan similar to air quality reports. Inform the public via a beach information board, local cable television, weatherman of television or radio. In addition, issue annual or seasonal Santa Monica Bay "swimming surfzone" water quality reports to increase public awareness and help local agencies to plan.
- ☐ Evaluate and update beach warning and closure protocols and Malibu Lagoon breaching protocol (SMBRP, 1992b).

Implementation of these Santa Monica Bay Restoration actions will help improve the monitoring and response protocols of the watershed. Specific problems which have been identified in this study, as well as recommendations for improvement, are discussed below.

Cooperation between Agencies

The lack of a coordinated regional monitoring program for the Santa Monica Bay as a whole leads to the lack of an overall picture of conditions and trends within the region (SMBRP, 1991)

Communication:

Although each agency that monitors in the Malibu Creek Watershed has its own mandate, more cooperation is needed between the agencies in order to provide a simpler and perhaps more comprehensive monitoring program. In the interviews with the agencies, the staff were asked questions about who else monitors in the watershed and with whom they cooperate or to whom they regularly send their data. None of the staff knew about *all* of the other agencies and most knew only about a few. Data are exchanged only among a few agencies. Examples are.

NPDES and WDR Permittees	interact with	Regional Water Quality Control Board
DWR	interacts with	Regional Water Quality Control Board
TLVRCD	interacts with	DPR

Rain gauges:

At least six different entities operate rain gauges in the Malibu Creek watershed: Los Angeles County of Public Works, California Department of Parks and Recreation, Ventura County Department of Public Works, the Los Angeles County Fire Department, the County Sanitation Districts of Los Angeles County (Calabasas Landfill) and Tim Thomas²². As many of these agencies need the data for prediction and/or modeling purposes, perhaps some data exchange would be useful. At least two of these agencies did not know about the other gauges.

²²The structures near the gage that Tim Thomas monitored were destroyed in the Old Topanga fires in October, 1993

Recommendations

Agencies need to communicate and coordinate. Data should be exchanged, perhaps through a central clearinghouse or database (Santa Monica Bay Restoration Project through Ecoanalysis is developing a centralized system as discussed below in the Public Access section). The operators of the rain gauge systems (at least six different entities operate rain gauges in the Malibu Creek Watershed) need to be, at the very least, informed about each other. One agency should plot them all on one map (DPW currently has a partial map to which they could add the other stations).

Need for comprehensive goals for monitoring programs.

While many of the agencies have clear and reasonable goals for their monitoring program, others do not appear to have comprehensive goals which relate to the Malibu Creek watershed. One agency said that they monitored (in Malibu) just to be complete. Another individual said that he did not know why he monitored at a particular site, they just had always done it (others at the same agency basically said that they should stop monitoring at that site but do not want to have negative repercussions from the public).

There is a need for quantifiable monitoring objectives that meet more general public concerns. Public concerns of protection of public health and protection of the health of the ecosystems need to be specifically addressed, and systems need to be set up to determine when the human health risks have been minimized and when ecosystem is back in balance.

When asked why they had chosen certain parameters, some of the agency's staff said that they had chosen "the standard water quality" parameters. There appears to be a tendency for overkill in the numbers of parameters. A careful evaluation is needed of what parameters are useful to identify certain problems.

The NPDES permittees, although expressing their own set of goals for protecting the watershed and Bay, are basically being required to fulfill the Regional Water Quality Control Board's goals. Overall, the permits appear to be quite thorough. There are, however, certain discrepancies between the permits (see permit section below). Many of the permits need to be updated to reflect an overall and consistent monitoring strategy for the watershed.

Recommendations

Overall goals must be established for the Malibu Creek Watershed. Monitoring goals for the watershed should take into account i) baseline studies, ii) areas which have undergone unnatural impact (high erosion in upper watershed is an area that has not been addressed by current monitoring), iii) compliance of dischargers, iv) human health and v) bio-monitoring aspects. An overall monitoring strategy for the watershed is needed in order to provide justification for which specific parameters and locations are chosen. Upstream cities should be involved in a goal setting process for the entire watershed and possibly should be performing some of the monitoring.

Some potential objectives for the Malibu Creek Watershed include:

- What are the pollutants that we should be most concerned about? What are the sources of these pollutants?
- What is the difference between and what is affected by wet weather versus dry weather flows?
- In the lagoon, what are the sources of coliform and pathogens? What percentage is from wildlife (birds)? What percentage from local septic tanks and drains? What percentage from upstream?

- ⌘ What pollutant load is the Malibu Creek watershed contributing to the Santa Monica Bay?
- ⌘ What are the contaminants of concern in the upper watershed lakes (SMBRP, 1993b)?

Comparison of monitoring in Malibu with the rest of the Bay and the Region

The Malibu Creek watershed appears to be getting a large amount of monitoring resources relative to the entire Los Angeles region. While it is undoubtedly one of the most important contributors to the Santa Monica Bay, agencies appear to be devoting a larger proportion of their budgets than would be strictly required when one considers the entire region. The Malibu watershed only represents approximately 109 out of 4292 square miles (or approximately one fortieth) of regional drainage in the Los Angeles-Ventura County area (RWQCB, 1975). In 1992, region-wide programs, in some cases, allotted a tenth of their resources to the Malibu Creek watershed. Many of the staff at different agencies said that they added the Malibu Creek watershed to their programs because of the public interest; it appears that public activism in the Malibu area is having a significant effect. Regardless of public activism, however, monitoring efforts that do not fulfill specific purposes or meet well defined objectives are not useful. Thus far, most of the monitoring attention has focussed on the lower watershed.

Recommendations

A tremendous amount of resources have been devoted to the Malibu Creek watershed. The resources, however, might be more effectively spent if an overall monitoring strategy is developed.

Overlaps in monitoring efforts

Several locations within the watershed are each sampled by many different agencies, while, at the same time, much of the watershed is not covered. Many of the agencies justify their sampling locations by the stations' spatial relationship to the Tapia Water Reclamation Facility; many want to sample downstream from the plant. Unfortunately, due to the steep slopes of the canyon, there are limited accessible sites. The result is that the Malibu Creek at Cross Creek Road station is monitored by four different agencies (see Table 2 above). Sites near the Tapia plant, such as the Salvation Army Camp Station and the area near the stream gauge are similarly heavily monitored relative to the large stretches of unsampled creeks and tributaries in the watershed.

An area of overlap in parameter coverage is that almost all of the agencies collect conventional minerals data.

Several agencies monitor oil and grease in the watershed. Oil and grease float, so any monitoring of oil and grease should be sampled specifically at the water-air interface, otherwise the data will usually be below the detection limit. Hyperion staff (LA-EMD) samples at the air-water interface, but it is unknown how many other programs specify sampling at that interface.

Recommendations

As the different agencies that monitor the Malibu Creek Watershed have different mandates, the monitoring efforts should be divided up to reflect these differences. Currently, several agencies are monitoring the same parameters at the same general locations as other agencies.

This report recommends that some of the monitoring stations for some of the agencies be relocated. The drawback to this restructuring would be a decrease in continuity within individual agency's data sets. An additional drawback would be a loss of the ability to cross-check the data of different agencies and the quality of the different labs sampling for the same parameters at the same location (however, in order to really check

this, the different agencies should all sample at the same time). There will, however, be continuity of data if one uses the data of all of the agencies; it is important to increase communication and data exchange among agencies.

- The Regional Water Quality Control Board, Planning Unit (RWQCB-P), should consider changing the Malibu Creek at Cross Creek station to a location in the upper watershed *Justification:* The RWQCB-P program is flexible and dynamic in its design, so switching locations is not difficult. In addition, the Malibu Creek at Cross Creek Road station has only been sampled 4? times by the Board, whereas it has been sampled much more extensively and for a longer time period by both Las Virgenes Municipal Water District and the Los Angeles County Department of Public Works. The RWQCB-P program is partially designed to look at nonpoint sources and an added station (to the 3 upper watershed stations) would be an enhancement to the program
- An additional station could be added to the Las Virgenes Municipal Water District (LVMWD) stations in Malibu Creek just above Serra Retreat, and their monitoring at Malibu Creek at Cross Creek Road could be reduced to quarterly and annual sampling. *Justification:* Because there is duplication of the Cross Creek station by the Los Angeles County Department of Public Works (DPW) program (and it is the only DPW station in the watershed), the sampling at this station could be significantly reduced to more of a double checking status with quarterly and annual sampling. The addition of a station on Malibu Creek, analyzed for the same parameters as the Cross Creek station, just upstream from the Serra Retreat, could help the LVMWD prove or disprove the allegation that some of the contaminants that are detected in the Malibu Lagoon are contributed by Serra Retreat
- If elevations of some of the enhanced parameters are detected in the one-year 1993 LVMWD enhanced program, these parameters should be included in the renewal of their NPDES permit in 1994. Conversely, any contaminants which are shown to be contributed by sources other than Tapia should have reduced monitoring requirements in their permit renewal *Justification:* The environmental groups felt that LVMWD was not doing a thorough enough job of monitoring, and to some extent, the enhanced program represents state of the art monitoring (pathogens, for example). It may turn out that the enhanced program will show that LVMWD is not the causative factor for some of the problems in the Malibu Lagoon and thus other monitoring programs (i e., septic tanks in Malibu Colony or in Civic Center area) may need to be implemented

Gaps in monitoring efforts

Need to expand monitoring of the upper watershed and look at more nonpoint issues:

Since point source monitoring is now well underway in the watershed and throughout southern California, attention has now switched to the problems of nonpoint source pollution. In Malibu Creek watershed, practically all of the attention thus far has focussed on point sources, and the monitoring programs reflect that focus. Most of the agencies have a station at Cross Creek Road because they want to get "end of the pipe" readings and want to be sure to get samples below the Tapia Water Reclamation Facility, the major point source in the watershed. It is time to focus more attention on the vast area of the upper watershed which has recently undergone rapid development. The only agency that has sampling stations in the upper watershed is the Regional Water Quality Control Board, Planning Division.

The contributions of urban runoff and other nonpoint contamination may ultimately end up in the lower watershed through groundwater seepages into the creeks (the hydrology will be determined by the SCS-NRP study). These areas are not being examined in detail. One area of possible immediate concern is the groundwater flow and ultimately possible surface flow from the Calabasas Landfill which has been shown to be leaking (see above).

Need to organize parameter coverage throughout the watershed:

A recent Santa Monica Bay Restoration Project report discussed what parameters, related to urban nonpoint source runoff, should be monitored in the Santa Monica Bay watershed. These parameters were chosen based on past sampling both locally and in other urban areas. The parameters include: total suspended solids (surrogate for heavy metals and phosphate and indicates unnatural erosion which might be construction or impervious surfaces-related); nutrients (indicates runoff from fertilized areas or discharge of sewage or industrial wastes); heavy metals (indicates runoff from domestic and industrial point-sources and urban storm water runoff), oxygen demand, aesthetics; organic pollutants; oil and grease; and pathogens (SMBRP, 1992). All of these parameters are currently being covered to some degree within the watershed, but an organized effort needs to be undertaken to ensure that the proper parameters are being sampled in the upper watershed in order to address specific problems and sources.

Need to increase monitoring for biodiversity:

Urbanization of southern California watersheds has led to decreased diversity of aquatic macroinvertebrates. This low biodiversity has been observed in Malibu Creek and Cold Creek (CalTrout, 1989b) and in Malibu Lagoon (TLVRCD, 1989). As biodiversity is a good indicator of overall health of the waterbody, specific monitoring of biodiversity should be included in future studies or monitoring efforts.

Recommendations

Parameter coverage of the Malibu Creek watershed needs to be organized to provide coverage of the entire watershed and to address nonpoint source contributions.

Monitoring station locations need to be organized. Logically the watershed does not have full coverage. The stations are clustered in the lower watershed to collect "end of the pipe" samples. Additional stations need to be located in the upper watershed in order to better understand the different nonpoint contributions from the rapidly developing areas. Some stations should be in undisturbed natural drainages for baseline or reference purposes.

Malibu Creek should be monitored just before the Serra Retreat to see if that area is a source of contaminants. The area of the Civic Center should be examined also. The proposed continuous monitoring station at Cross Creek in the Los Angeles County Department of Public Works' NPDES permit should be *required* by the Regional Water Quality Control Board.

Additional biomonitoring should be included in future monitoring plans.

More attention is needed for sediment analysis. Sediments should be chemically analyzed above Tapia (currently they are monitored only below Tapia). Sediment distributions in channels should be mapped throughout the watershed.

A 24-hour lagoon water level monitoring device should be installed in order to help address breaching and flow questions.

Sampling protocol ideally would be changed. It would be best if all sampling was coordinated to be done at the same time in order to eliminate temporal and seasonal variations and to facilitate comparisons to give an accurate overall picture of the watershed; samples should relate to each other²³ (SMBRP, 1991).

²³ The Regional Water Quality Control Board and other agencies performed Intensive Surveys of the watershed in 1993 (see section under Special Studies)

What is being done with the data/What decisions are made with data

Based on the interviews with the agencies, policy and other decisions are not always being made based on the data. Although some programs directly use the data to fulfill objective goals, much of the data sits on the shelf. Many of the decisions that *are* made are adjustments in the next year's sampling program. The data of other agencies, aside from the previous self-monitoring by the permittee, are not used by the Regional Water Quality Control Board in writing renewals of NPDES or Waste Discharge Requirements permits. The data are not being used to complete the loop between information generated, analysis and policy review.

The Regional Water Quality Control Board has made significant strides in assessing the condition of waterbodies within the region with a relatively small and focused amount of data (the surface and groundwater monitoring programs, the Mussel Watch and the Toxic Substances Program). Unfortunately, a large amount of data that comes to the Board in the form of discharger self-monitoring reports are not analyzed due to inaccessibility. These data are generally noted for compliance and then put onto the shelf. What is badly needed is to require that data be sent in on computer disk and for staff analyze the data based on questions that the monitoring was designed to answer. Some of the existing permits require that the data be sent on disk, but this has often not been complied with (Hyperion only sends a small portion of the data on disk). Calabasas Landfill data (cumulative compilations) are sent in on disks regularly.

Recommendations

Data generated by the monitoring programs need to be usable and easily accessible. The most urgent need is that the discharger self-monitoring data (which represent the bulk of the monitoring dollars spent) be sent in to the Regional Water Quality Control Board on computer disk and put to use. The data from the entire watershed should be used for updating permits and management programs.

Need for leadership at high levels

Top down decisions:

As part of their assessment of monitoring in Santa Monica Bay, Thompson and others (SMBRP, 1991) observed that monitoring objectives need to be developed "from the top down," and "should be based on clearly stated public concerns and management and scientific objectives." The staff who are implementing the programs at each of the agencies are dedicated and talented scientists, engineers and planners. There appears, however, to be a lack of clear decision making based on definite objectives as defined by upper management. When queried about why certain parameters were chosen, several of the staff said either that they did not know or that the parameters were chosen because they are "standard". There is a good deal of inertia in some of the monitoring programs. Things have always been done that way, so things just continue. Rather than readjust parameters, new parameters are sometimes just added to the old ones (even if the old ones have consistently come up as "not detected"). The information needs to be checked to see if values are meeting management objectives and, if they are, then the frequency of sampling for those particular items could be reduced. Difficult decisions about making radical changes in sampling programs need to come from the top. With limited dollars available for monitoring, perhaps more definitive decisions should be taken on the specifics of the programs.

Municipal NPDES permit:

Entities that are co-permittees²⁴ with the Los Angeles County's Municipal NPDES permit are taking only minimal responsibility for monitoring efforts, they are relying on the County to perform the required work both in planning the monitoring and in implementing the monitoring. There needs to be an overall leadership within the watershed on the issue of non-point source pollution. It is difficult for the agencies and cities, who all have different mandates, to communicate effectively, this is where a non-regulatory program like the Santa Monica Bay Restoration Project or other forms of public-private partnerships, such as the Joint Powers Authorities, special districts, etc., can step in.

Regional Water Quality Control Board Compliance Monitoring Budget:

At the Regional Water Quality Control Board, there is a need for more laboratory money and a need for quicker and clearer decisions about the budget allocations. Unfortunately, from year to year, funding is uncertain. This uncertainty makes it difficult for advance planning of compliance inspections and monitoring. This uncertainty also results in the money allocated for NPDES compliance not being spent; in 1991-1992, for example, \$74,000 was finally allocated for compliance laboratory expenses for three of the Board's divisions which oversee NPDES permits, but only \$62,150 was spent. The money was probably put to good use for compliance monitoring in other divisions at the Board but at the expense of monitoring of the NPDES dischargers. There are over 500 NPDES permits regulated at the Regional Water Quality Control Board (52 are both category 1 {major threat to water quality} and complexity A {major facility}); a budget of \$74,000 does not seem sufficient (for example, a recent, partial compliance sampling session at Tapia, a moderate sized discharger, cost over \$1,500) (RWQCB, 1992c)

Recommendations

Upper management needs to clearly state monitoring goals and policies about selection of parameters and locations

Santa Monica Bay Restoration Project and Los Angeles County Department of Public Works need to assist with the delegation of responsibilities and the establishment of overall goals for the Municipal urban runoff NPDES permit.

The Regional Water Quality Control Board needs more laboratory money for compliance and ambient monitoring.

Need for Weather Policy

Many of the monitoring agencies do not have a consistent policy for handling with storm and dry weather sampling. It is well known that there is a certain amount of lag time after storms before streams are back to "normal." Shoreline stations typically took 2 to 3 days to return to background levels of bacteria after a storm (LADPW, 1990). Many agencies do not explicitly state how long the samplers must wait after a storm until they collect dry weather samples. In addition, at one agency, samplers who are supposed to collect storm samples

²⁴Cities and other copermittees have made progress in 1993 and early 1994 towards compliance with the Municipal NPDES permit. As noted in the Regional Water Quality Control Board's Review of Second Year Compliance, the "Staff of the Los Angeles County Department of Public Works has improved co-permittee participation and communication between permittees and the Regional Board in the past year by conducting monthly action meeting for the different phases [of the permit]" (RWQCB, 1993b). Four of the watershed cities have participated fully in the Malibu Creek Natural Resources Plan Group.

The Natural Resources Defense Council (NRDC) and others have threatened litigation against several cities and filed suit against CALTRANS for noncompliance with the permit. In addition, the Regional Board issued a Cease and Desist Order (Order No 93-081, December 6, 1993) to CALTRANS for failure to comply with the permit.

are not always able to collect the samples in a timely manner but label all of the storm samples "wet weather" even though they are collected at different times within the storms (they need to provide a mechanism for recording accurately the storm point of collection) Another problem is that many of the monitoring reports do not note the weather conditions.

Recommendations

The different monitoring agencies need to formulate specific guidelines for sampling during and after storms All permits should require that weather conditions at the time of sampling be included in monitoring reports.

Regional Water Quality Control Board Permits

Outside Expertise/ Permit writing:

The Regional Water Quality Control Board is both understaffed and overloaded with new permits to write Many of the existing permits are out of date (they are supposed to be renewed every five years). Early contact with the public or interested parties during the permit writing process is minimal.

Update, rescind or renew permits:

Many permits need to be updated, and some of the conditions of existing permits are not being enforced These permits should be enforced. Permits that have been superseded should be rescinded. Another problem with the LVMWD permits is that none of the relevant permits directly covers the percolation ponds (there is a significant amount of discharge through the ponds (see LVMWD above); these ponds are a matter of concern for the State Department of Parks and Recreation. Permits have not been written for the large number of commercial septic systems in the watershed (i.e., the dischargers have not submitted applications to the Board). The Board only has permits for about four commercial systems in the Malibu Creek watershed.

Make permits consistent throughout the watershed:

Permit conditions and requirements are not consistent throughout the area. Temperature requirements should be included in all of the permits for the Malibu Creek watershed and treated in an uniform manner. Commercial leach systems should be treated in a more uniform manner with a consistent policy about groundwater monitoring well requirements Only one of the commercial septic tanks permit has required groundwater monitoring wells. The Board's new general permit for septic systems will help with consistency throughout the region

Review of and compliance monitoring of dischargers:

The Board is responsible for reviewing and performing compliance monitoring of all of the NPDES and WDR permitted dischargers. Unfortunately, due to staff turnover, budgets constraints and uncertainty of laboratory funding from year to year, compliance monitoring and monitoring report review is performed at a minimal level. Many of the individuals responsible for review of the monitoring reports do little more than check off that the reports have been received and note that the discharger is generally in compliance. There is no summary within each file of what the permits require; it is difficult to leaf through pages of permits to uncover what should be in each weekly, quarterly or annual report. This is true both for new employees as well as those familiar with the individual permits, as each staff person has to review a large number of permits Changes that have been made (via letters) are not always noted on the permit and thus new details about the monitoring programs (a plant may have stopped discharging at one of their locations, for example) can get lost. Due to staff turnover or other factors, several of the engineers did not know about certain requirements which are in the permits when questioned.

Recommendations

Some of the non-major NPDES and WDR permits have expired and need to be renewed. This would be a good opportunity for the Regional Water Quality Control Board to modify permits to include relevant watershed-related monitoring requirements. In addition, for certain major permits, the Board could, early in the permit writing process, survey the opinions and concerns of outside activists and individuals and members of the regulated community who may have a stake in the permit. The public needs to educate itself about the permit writing process and contribute when possible.

Overall, the permits need to be made more consistent. Permits need to be updated to reflect information obtained from monitoring programs. Some effort should be made to locate all of the unpermitted commercial leachfields in the watershed (there should be many more than 4 in the entire watershed). A simple and easy to understand summary of each permit's requirements and limits should be placed in the front of each permit file so that it is not necessary to rifle through a large number of pages and so that new information that is not part of a new permit can be easily tracked.

More communication between the biologists (who help write the new permits and write the receiving water monitoring programs) and the engineers is needed. There needs to be a feedback loop between the two groups when reviewing monitoring reports and writing or revising permits.

A guidebook should be developed to aid in writing permits. This guidebook should include specific information for each watershed that should be considered in the permits for each area. Major problems in each river could be addressed in permits. For example, most of the permits for surface water discharge in the Malibu Creek watershed should include a temperature requirement because of the steelhead trout run. A flow chart or check list could ensure that all permits are consistent with requirements for nearby dischargers and that permits include relevant information from USEPA regulatory or guidance documents, the *Water Quality Assessment Reports*, state and regional *Water Quality Control Plans* and other documents.

Public Access to Monitoring Data

Currently, the public has full access to the data, but identifying and acquiring the data is difficult. As a result, or perhaps due to a lack of interest, few data are requested. The staff at one agency said that no one had ever asked for the data. The members of the public can call any of the agencies directly and request copies of data. Although some agencies publish an annual report with data, most do not. In addition, a central index for the region or even an index for each agency is lacking. One example is the Regional Water Quality Control Board which lacks an easy way to identify what permits have been written for a certain area (i.e., the Malibu Creek watershed).

The Santa Monica Bay Restoration Project (SMBRP, 1991) plans to implement a data and information management system that will be an integrated information network. The proposed system would have menu-driven query interface capabilities so that an individual, with no programming knowledge, at one location could easily access an index of data from all agencies. The user would then interface with each agency to retrieve the actual data. The benefits to such a network would include:

- Two-stop shopping would be possible for researchers or agencies who need access to monitoring data;
- Monitoring data could be analyzed in a uniform way; and
- Watershed-wide and regional trends could be more easily recognized (SCAG, 1988; NRC 1990).

Criticisms by the agencies of an integrated computer network include:

- Data would not be standard throughout the system, each agency would still have their own notations;
- Cost for enhanced computer systems(probably a mini-mainframe or a VAX) might be prohibitive, and a task-dedicated staff person might be required at each agency. In times of budget cutbacks, this additional expenditure would not be easy to obtain at the agency level (Interviews with the agencies; SMBRP, 1991).

Recommendations

Before ways of data-sharing are implemented, a few other recommendations are:

Annual reports:

Every agency should publish an annual compilation of their data similar to the old Department of Water Resources annual publications. These reports would provide a hard copy of easily referenced data for future studies and enable the comparison of data within the watershed and within the region. Publishing such a report would not be that difficult for each agency since all of the agencies already have the data compiled in spreadsheet or database programs on computer. Some interpretive information and appropriate disclaimers should also be included.

Since the public is not aware of the substantial amount of data that are collected by these agencies, annual reports would be a form of good public relations.

Central clearing house to act as an index of the data:

One agency could act as the central clearinghouse and publish an index to the data sources within the region. Another alternative would be to have the lead agency be a University library.

List of permitted dischargers:

It would be a great service to any interested researchers or the public if the Regional Water Quality Control Board could publish a list (and map) of all of their regulated dischargers including locations, receiving waters, and parameters. At this point, there are partial lists, and it is difficult to track all of the information.

Policy about staff's proprietary use of data:

Many staff members at different agencies expressed concern about being able to study and present findings about the data before other scientists are allowed access to the data. This is a question about "proprietary" use of data. The different agencies, at high levels, need to develop a policy about the publishing of data and studies. Does the data belong to the public? If so, at what point does it belong to the public? A similar issue exists in the scientific community at large, and other government-funded research (National Science Foundation funded studies, for example) allow researchers to not release data until they publish. As the results of monitoring programs are all "public data," a release policy needs to be developed. The publishing of annual reports would help alleviate this problem.

Response Protocol

How agencies report violations:

All of the agencies indicated that if they discover any obvious spills or other serious problems, they contact the appropriate authorities.

Beach closures:

The Los Angeles County Department of Health Services has a beach closure protocol based on the amount of spillage, over the course of the summer of 1992, beaches (not Malibu) were closed several times. One question is Do we close more beaches simply because we have more data and/or we have more stringent standards?

California was ranked number 1 in beach closures by a Natural Resources Defense Council Report for 1991 (745 closures in 1991), with southern California accounting for the bulk of these (588) The staff at the County Department of Health Services state that the reason we have so many closures is because there is better and more extensive monitoring in southern California than other parts of the country (Daily News, 1992).

The data for Los Angeles County shows that although many of closures are due to large spills or events which would have been reported to the Regional Water Quality Control Board under NPDES or WDRs requirements, the regular monitoring programs helped increase the beach closure total. In Los Angeles County, according to Department of Health Records, beaches were closed a total of 43 times from 1987 to September of 1992. Of these, the 17 closures were due to sewage spills or overflows at sewage pumping stations or at treatment plants and would have been reported. Seven were due to blocked sewage lines and might have been reported. Three were due to diesel spills and would not have been detected by bacteria sampling but might have been detected by visual inspections at the time the bacteria samples were taken. Sixteen closures could have been detected with the benefit of water quality monitoring including those which had unknown sources or were small sewage leaks (one case was an area with excessive bird population).

Of the 43 beach closures in Los Angeles County in the period from 1987 to 1992, four closures included Malibu Beach. Two of these closures affected large stretches of Los Angeles County beaches and were the result of sewage discharge from North Outfall Treatment Facility. One of the Malibu closures was due to a diesel spill (3/24/91) and the other closure was due to washout of private sewage treatment systems during heavy rain (3/1/91).

Long term response protocol for the watershed:

With the exception of some of the Regional Water Quality Control Board programs (Toxic Substances Monitoring and State Mussel Watch), and the Topanga-Las Virgenes Resource Conservation Districts' effort, monitoring agencies do not have institutionalized responses to long-term problems. Data are not analyzed in depth to determine what response should be given

Recommendations

Beach: public health:

A number of activists expressed a desire that the Department of Health services (DHS) install a beach board or release data to the media on a weekly or daily basis. The DHS is opposed to such a release of information because

- 1) the laboratory turn-around time is 3 days and therefore the data are somewhat out of date by the time the results are in providing a "snapshot of the past" (need to have verification of long-lived problems),

- 2) there is a great deal of variability in the data and individual data points could cause public hysteria if not taken correctly into context, and
- 3) the DHS does not have the resources to answer a large number of phone calls from concerned individuals who do not understand the data

The DHS produces a monthly report tabulating their data (and exceedances) and those of the Hyperion, the Los Angeles County Sanitation District, and the Terminal Island programs. Data from Hyperion are transferred daily via modem to the DHS. It appears that it would not be difficult for the DHS to develop a mailing list to which this monthly report would be regularly sent (including public activist groups such as Heal the Bay). The DHS could also immediately notify the members of this proposed mailing list whenever any unusually high densities are found (i.e., high enough to warrant further attention by the DHS). The members of this mailing list would understand the context of the numbers and would be able to inform the public in a timely manner (i.e. through the media) of any public health hazards. The current beach closure notification list only includes government agencies. The Department's response to this suggestion is that they are "responsible for informing the public of known health hazards and conducting appropriate regulatory activities. This responsibility cannot be delegated" (Petralia, 1993).

The City of Los Angeles, Department of Public Works, Environmental Monitoring Division, has a state of the art system for analyzing for bacteria, which has a turn around time of 18 hours, and perhaps could aid in determining health hazards county-wide

Long term problems:

There are perhaps not the resources within *individual* agencies to address the long-term problems, but perhaps resources from many sources could be pooled in order to respond to any problems indicated by the monitoring data.

The Question of How much Data Collection is Enough

A recent Los Angeles Times article discussed the point of "garbage in, garbage out." Many of the laboratories and samplers in the environmental field cut corners, perform sloppy field work, or otherwise allow incorrect data to get through the system (LA Times, 1992). Rather than simply continuing to pile up a large amount of data that only gets cursory reviews for the most part, perhaps some of the focus and the resources should switch to carefully planned focused special studies and, some would argue, *responses* to the identified problems

Do we have enough of certain types of data?

Quote from one staff person. "when do you draw the line that you have enough information and have to do something; one needs to respond unless one is conducting long-term trend monitoring"

PROBLEMS IN MALIBU CREEK WATERSHED THAT COULD BE ADDRESSED BY MONITORING AND/OR SPECIAL STUDIES

Monitoring of percolation ponds:

Percolation ponds located in Tapia park are used by the Las Virgenes Municipal Water District as a discharge point. Many of these are not functional, they were destroyed by floods in February, 1992, but are still being used by LVMWD. The Department of Parks and Recreation has a policy of not allowing restoration by outside agencies of any park property and would not be in favor of restoration of the ponds by LVMWD (Goode, 1992, MWCRM, 1990). These ponds need to be better monitored and inspected

Excessive nutrients present in lagoon:

Several organizations have called for an analysis of excess nutrients in the Malibu Lagoon (CSCC, 1992). Current monitoring which includes nitrogen-related and/or phosphate data occurs at Tapia discharge, a well at Cross Creek Center, and Malibu Creek at Cross Creek (by RWQCB-P and DPW). In addition, the enhanced monitoring for Tapia includes much nutrient monitoring. Some of this enhanced nutrient monitoring should probably be included in the renewal of the Tapia NPDES permit. For a complete assessment of the nutrient input, however, in addition to the existing information, more wells would probably need to be installed around the lagoon.

Sediment:

Sediment quantity and distribution is not monitored in the watershed. Excess sediment has caused problems in the lagoon. It was estimated that mass emission of silt from the Malibu Creek watershed was about 1000 MT in the water year 1971-72 (SCCWRP, 1973 in SMBRP, 1993a). A related problem is silting in the upper watershed lakes. More needs to be done to understand the sedimentation rates and distribution patterns (Manion, 1992). Maps of sediment distribution in the watershed should include information on grain size in order to establish the most suitable management strategy. For example, fine sediment eroding off of exposed land is not usable for beach restoration and may have a negative impact in the lagoon (Philip Williams et al., 1992).

Source of high coliform counts and pathogens:

There is a perception among beach users that the lagoon is essentially a large sewer. It occasionally smells and is often murky reflecting its essentially brackish nature. As a result of the public displeasure with the lagoon, it sometimes gets breached at night by unknown individuals with shovels (Goode, 1992). The beach adjacent to the lagoon does not often get sampled just after breaching (although in the past, it was sampled by the County Department of Health Services). Comprehensive testing of lagoon just before and just after breaching of lagoon is needed rather than "poorly located samples at widely separated time intervals" (Philip Williams, et. al, 1992).

The source of the high coliform counts needs to be investigated further. Some of the staff feels that the biggest contributors to the high coliform counts are birds. Peter Williams et al. (1992) assert that a duck can produce up to five times more coliform bacteria (number/gram of feces/day) than a human. In addition, viruses in the lagoon were found during a special Santa Monica Bay Restoration Project study conducted in 1991/92 (SMBRP, 1992e).

Samples for bacteria need to be correlated with "other biochemical influences such as pH, salinity, water depth, algal blooms, and numbers of birds" factors which might skew the data (Philip Williams et. al, 1992).

It is difficult to monitor viruses. Total coliform and fecal coliform have been monitored for a long time as an indicator of sewage spills. However, there is considerable concern by the public and activists that they do not represent the true human health hazards. Enterococcus has proven not to be a much better indicator (SCAG, 1988; SMBRP, 1992e).

In addition, there is a need to study germs in Malibu Lagoon and in nearshore beach sands, foam, and waters to determine where health hazards exist when the lagoon is breached (Harris, undated).

Ownership and monitoring of drains:

Several pipes discharge into the lagoon. One drain is "unclaimed", three major drains into lower Malibu Creek and Lagoon include Malibu Colony drain, Civic Center Drain, and Cross Creek Drain (Texaco effluent is into

this one) (figure 5 above). There is also a small drain from the Pacific Coast Highway and a small pipe from a Colony tennis court (Philip Williams et. al, 1992) In general, these drains are not monitored.

Septic tanks near Malibu Lagoon and other areas:

A study needs to be undertaken to see if contaminants from malfunctioning septic tanks in the watershed are interacting with the ground and/or surface waters. One area of concern is the Malibu Colony adjacent to the Malibu Lagoon. There have been reports of plumbing backing up in those homes due to high water level in the lagoon. In 1986, prior to the incorporation of the City of Malibu, Malibu Colony, the Civic Center and other areas near the Malibu Lagoon were considered "Priority 1" for sewerage by the Los Angeles County Department of Public Works. Depth to the ground water in those developed areas is low (possibly as low as a few feet) (LACDPW, 1986a). Tests that are needed in the Malibu Lagoon area include isotope, dye or bacteria (killed polio virus, for example) tracer studies of the interconnection between groundwater and septic tanks in the wet season when the lagoon water level is high. In addition, a system of piezometer wells is needed to check the groundwater flow directions (Philip Williams et al., 1992).

A comprehensive study would need to include septic tanks both at lagoon and upstream. Septic tanks from the businesses north of the Pacific Coast Highway bridge may not be located properly in relation to the lagoon and there is some question about the contribution from Serra Retreat.

Much of the focus of public concern about septic tanks has been on the lagoon, however, other areas, such as Malibu Lake and Medea Creek, need to be looked at as well.

Temperature in Malibu Creek:

Steelhead trout and other organisms are sensitive to temperature regimes in the creek water. CalTrout (1989b), under contract to CalTrout, recommended a detailed study of water temperatures in the creek in order to aid in the determination of the need to manage discharges from Tapia or other sources.

Unnatural amount of water and water flow in the Lagoon:

An unnatural increase in water flow, nonpoint pollution inflow, and frequent breaching of the Malibu Lagoon has contributed to decreased biodiversity and possible human health risks near and at the Malibu Lagoon. Subsurface and surface flow needs to be better understood. Water seepage through the sandbar in lagoon entrance has not been studied (Manion, 1991). Many people would like to see the Department of Parks and Recreation install a 24-hour water level monitoring device in the Lagoon.

Biodiversity in creek:

There is a need for increased bio-monitoring and additional studies of organisms in the watershed. Ideally one would sample the range of organisms and then resample over time to see effects of urban runoff. In Cold Creek stone flies and newts are sensitive organisms and might be good candidates for such studies (Goode, 1992).

RECOMMENDATIONS FOR PUBLIC ACTIVISTS

Formalize Visual Observations:

Several members of the public, notably the surfers, are intimately familiar with the visual quality of the beach waters. These individuals could be utilized to assist in the monitoring of the watershed and the surfzone in particular. A formalized system could be set up, perhaps through the lifeguards, to file observations and health complaints. The surfers could provide valuable information over time.

Activists and concerned individuals assist with permit writing:

Outside individuals who have a stake in the areas that are covered by Regional Water Quality Control Board permits should inform themselves about the permit writing process. Public activists and other individuals could take an active role in contributing their concerns early in the permit writing process and in reviewing major and minor permits in watersheds of interest. The NRDC and Heal the Bay were already involved in part of the permit process as they developed the enhanced monitoring program with the Las Virgenes Municipal Water District.

SUMMARY OF FINDINGS/RECOMMENDATIONS

- ☒ There are many positive aspects of the monitoring programs conducted in the Malibu Creek watershed. A large amount of money and resources have been committed to the watershed by local and regional agencies. Many of the monitoring programs have flexibility built in to their design so that the programs can be changed to address new problems. In addition, a one year enhanced monitoring program, by the Las Virgenes Municipal Water District, will add needed information about the lower watershed and help lay the foundation for a future more comprehensive monitoring program.
- ☒ Many of the monitoring programs are not familiar to members of the Malibu concerned public (i.e., people interviewed in this study) or even to the staff of other agencies that monitor in the watershed. The agencies need to do a better job of publicizing their monitoring programs.
- ☒ The Malibu Creek watershed represents approximately one fortieth of the total drainage area within the jurisdiction of the Los Angeles Regional Water Quality Control Board's (most of Los Angeles and Ventura Counties), and yet the watershed receives large amounts (more than 1/40) of the financial expenditures of some regional programs.
- ☒ At present, there are no overall goals for monitoring in the Malibu Creek watershed. A watershed-wide technical committee should review all proposed monitoring goals and sampling procedures. A triggering or threshold policy should be developed in coordination with the monitoring goals. If a constituent is found to be above the "action level," then specific, predetermined agency actions should be implemented. Upper watershed cities, now only minimally involved in monitoring, should be more involved in the overall strategic planning.
- ☒ Leaders at the different agencies need to be involved in evaluating the current policy goals of the monitoring programs. Some aspects of the programs should be eliminated or cut back, but inertia tends to keep them in place.
- ☒ Increased communication is needed between the different monitoring agencies in order to effectively coordinate the overall monitoring effort of the watershed. Data should be made available for exchange.
- ☒ There is some duplication in monitoring, both in parameters and in monitoring locations. Malibu Creek at Cross Creek road is monitored by four different agencies. The Regional Water Quality Control Board should consider moving their sampling station from Cross Creek Road to a new station in the upper watershed. The Las Virgenes Municipal Water District should consider reducing sampling at Cross Creek Road and adding a sampling location above the Serra Retreat to use as a comparison location.
- ☒ Some of the gaps in data collection in the lower watershed have been addressed by the enhanced monitoring by Las Virgenes Municipal Water District. Overall, however, the parameter coverage of the entire watershed should be organized to address problems, or potential problems, watershed-wide. Increased monitoring for biodiversity and sediment runoff is needed. Biomonitoring should be added.

- ❏ Ground water in the watershed needs to be studied. The possible interaction of ground water with septic systems near the Malibu Lagoon, and at other areas, and the alleged leakage of chemicals from the Calabasas Landfill, should be considered in future hydrogeologic models.
- ❏ Permits and Requirements issued by the Regional Water Quality Control Board determine much of the monitoring that occurs in the watershed. Many of the NPDES permits and Waste Discharge Requirements in the watershed, and in the region as a whole, either need to be updated (renewed), enforced (some aspects of permits need to be enforced), or rescinded (officially terminated).
- ❏ A consistent weather policy (i.e., sampling during storms) needs to be established by each agency.
- ❏ The public needs easier access to the monitoring data. A centralized clearinghouse that would serve as an index to the locations and types of data would be useful. Each agency should publish an annual (or periodic) report of the data. This would provide researchers, other agencies and concerned members of the public, with accurate and timely accounts of the data and would also provide as much needed positive public relations for the various agencies.
- ❏ Response protocol for crisis situations (spills, etc) are established, but response protocols for long-term problems are not institutionalized. Many data have been collected, and some people think that it is time to address the problems that the data have revealed.
- ❏ Beach closures are an important response issue in the Santa Monica Bay. In order to better include all interested parties in the information loops, Los Angeles County Department of Health Services should add environmental groups to its Beach Closure Notification List (which currently only includes government agencies).
- ❏ Public activists concerned with the Malibu Creek watershed should, with the assistance of the regulatory and resource agencies, educate themselves about all of the permits in the watershed and about the permit writing and approval process. The public should become involved with those permits which are relevant to their particular concerns (as in the enhanced monitoring program resulting from the environmental groups' agreement with the Las Virgenes Municipal Water District).
- ❏ Surfers, and other members of the public, including hikers and citizen volunteers, are front-line observers of environmental problems in the lower watershed. There should be a formal system for documentation, collection, and reporting of observations by members of the public about health problems, spills or other problems. In addition, a citizens volunteer monitoring program should be initiated. These observations should be accurately and effectively communicated to all concerned in the community.

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APPENDICES

Appendix I. Malibu Creek Watershed Monitoring Interview Questions

QUESTIONS FOR INTERESTED PUBLIC AND ACTIVISTS

Overall, what is your impression of how good a job the resource, regulatory and discharge agencies are doing monitoring various aspects of the watershed?

Do you feel that Malibu Creek is safe for human and wildlife use? Malibu lagoon? surfzone?

What agencies do you know have monitoring programs?

Do you know of any gaps or overlaps in monitoring data?

What do you think should be the overall goal of monitoring programs?

Should monitoring be background-, compliance-, remedial-, public health- or other -oriented?

Are there any particular locations that you would like to see monitored?

What parameters? physical metals nutrients VOC pesticides don't know

Do you feel that you currently have access to the monitoring data?

What data would you like to have access to?

For what purpose would you use the data?

What should the agencies do with their data?

Do you have access to a computer with a modem? Would you be interested in accessing data through computer?

What ideas do you have for improving public access to monitoring data?

What about public input on monitoring decision-making?

How should the monitoring programs be paid for? a) increased water fees b) increased taxes? c) special assessments (property tax, etc.) d) increased beach parking fees e) increased user fees?

Do you have any areas of concern about monitoring? Do you think that citizens should do monitoring?

Are you aware of any special studies of Malibu watershed? Malibu Creek Watershed Monitoring Interview Questions

Appendix I. Malibu Creek Watershed Monitoring Interview Questions (Continued)

QUESTIONS FOR MONITORING AGENCIES

Philosophical Questions:

When and why was your monitoring program started?

Do you have an overall mission statement for the monitoring program? If not, what are your fundamental goals?

Is monitoring ambient-, compliance-, remedial-, public health- or other -oriented?

If you were to lose funding, which sampling would be eliminated? what are priority items?

Have you recently changed your monitoring program? If so, why?

How did you decide which locations to monitor?

Technical Questions:

How many stations in Malibu Creek Watershed?

How many stations overall in southern California?

How frequently do you sample in MW (for each station)?

For what do you sample?

Do have a set monitoring schedule?

How did you choose the parameters?

What kind of flexibility is in program? (heavy rains, drought, emergencies etc)

Does any of your monitoring relate to natural background values? If so, which?

What are your approximate costs (annual budget)?

Who samples?

What is your field sampling protocol? (any quality assurance?)

What lab does the quantitative work?

Do you send them duplicate samples or use any other method to check the lab's accuracy?

Does your lab always meet holding times?

Has EPA tested your lab?

Data Dissemination Questions:

Is the data computerized? What type of system?

In house, what do you do with the data? What decisions are based on monitoring?

Do the results from one sampling data set alter the next sampling regime?

Do you analyze trends?

Have you changed your monitoring program in response to new laws or regulations? or public opinion?

To whom do you regularly send your data?

What kind of access does the public have to the data?

If you see problems, what is your procedure? What do you define as problems?

Other Questions:

What other agencies sample in MW?

Have you coordinated your monitoring with any other agency or group? Do you do monitoring on behalf of anyone else?

Are you aware of any duplication of your efforts?

Are you aware of any gaps? Where are there deficiencies in your data?

Do you have any areas of concern about monitoring?

APPENDIX II: Newspaper articles

Fact-finding session on Malibu Lagoon airs pollution concerns

By Manley Witten
Editor

M-Times
11/8/90

Residents concerned about Malibu Lagoon pollution had a chance to take their case to a state Senate fact-finding committee Friday.

Sen. Art Torres (D-L.A.), chairman of the Senate Committee on Toxics and Public Safety Management, told residents at the Malibu Community Center there should be one conservation agency that monitors water, land and waste pollution.

"Thank God my prayers were answered," Torres said, "that (Gov. George Deukmejian) is not going for another term. Deukmejian consistently vetoed my attempts to have one conservation agency."

"We need someone everyone is afraid of to round (the responsible agencies) up," Torres said.

His comments came during a fact-finding meeting he chaired to address pollution concerns in the Santa Monica Bay, including the Malibu Lagoon.

He said he and Sen. Herschel Rosenthal (D-L.A.), also a member of the Senate committee, will try again next term.

Much of the meeting concerned criticism that monitoring of pollution in the lagoon is inadequate.

Malibu resident Dr. Jeff Harris told the committee the coliform counts and nature of testing done by Los Angeles County in the lagoon are not disease-specific.

In addition, he said, "The information we do have is not given to the public."

He complained that the county chose to test near the Malibu Pier rather than at the mouth of Malibu Creek, "where polluted water goes into the lagoon."

"(County officials) don't monitor the lagoon when it is open and flowing," he said.

"Lagoon counts would probably go off the scale," Jack Petralia of the county Health Services Department said. "The dissipation is so great (by the time the water gets into the lagoon) that it would not be a representative sample."

Harris disagreed.

"Some fecal coliform dies, but viruses and other bacteria still exist" in the lagoon, Harris said. "This wouldn't be picked up by county studies."

When Torres asked why the Tapia Reclamation Plant periodically releases a large amount of water into Malibu Creek instead of recycling it, Richard Harris assistant executive officer of the L.A. Regional Water Resources Control Board, said, "We're the Water Quality Board, not water quantity board."

Torres chastised the county officials for not talking enough to each other to address the problems.

Torres said he wanted "an assertive commitment from the L.A. County Health Department that a hot spot will be identified (at the lagoon) and worked on quickly."

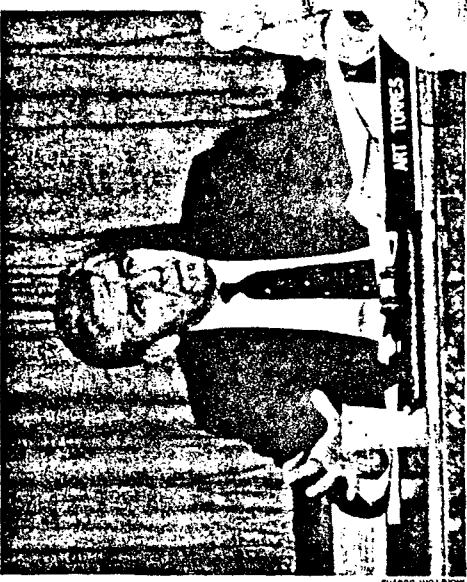
He urged Jeff Harris to submit a package at the Dec. 3 county Water Quality Control Board regarding closer monitoring of disease-causing bacteria.

Shows Interest in Local Waters PUSH EMERGES TO REOPEN ISSUE OF TAPIA DISCHARGE

Date?

Last Friday's special state legislative hearing to investigate toxic contamination in Santa Monica Bay aured some long held local concerns about the Las Virgenes Municipal Water District's Tapia facility and could result in its permit for creek discharge being brought up at the Regional Water Quality Control Board meeting in December.

Rather than hone in on part of the proposed Los Angeles County regional sewer system for



HEALTH EXAM -- The State Senate Committee on Toxics and Public Safety, chaired by Senator Art Torres (D-Los Angeles), conducted a special hearing on toxic contamination in Santa Monica Bay last Friday in the Malibu Community Center auditorium.

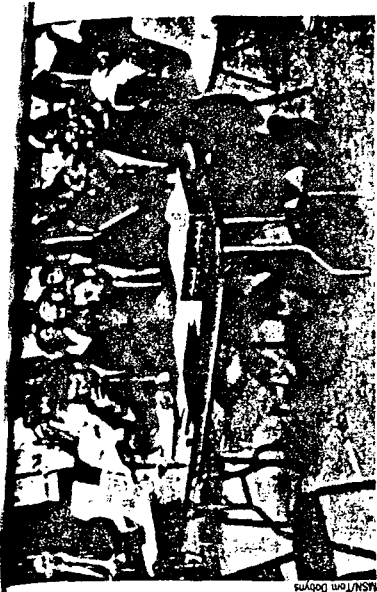
Malibu and the ocean outfall ear-marked for Corral Creek was not addressed to any extent, even though in terms of potential impact, the local system's might ultimately be greater.

Torres urged study of additional storage options for wastewater facilities so that treated effluent need not be dumped down creeks into the ocean, but could be stored for sale or employed for multiple purposes such as irrigation and firefighting.

The committee chair, who recently co-authored legislation (AB 475 signed into law last year) with colleague Hersche Rosen-thal who took part in the hearing, that aims to identify toxic hot spots, indicated that Malibu Lagoon could be expected to fall under that rubric.

The sole reference to the proposed Malibu sewer system came when Richard Harris of the RW-QCB staff agreed that the lagoon area would be designated a hot spot, but that "Malibu sewers will go a long way to correct [local] septic tank influences on the lagoon."

Among the groups taking part in Friday's discussion were the Citizen-Scientist Task Force to Heal Malibu Creek, Lagoon and Beach; Save Our Coast; the Natural Resources Defense Council; the Topanga-Las



TOXIC TESTIMONY -- Three representatives from the County Lifeguards shared their concerns about the health and safety of the waters off Malibu shores with the members of the committee.

Virgenes Resource Conservation District; Heal the Bay and others.

The upshot of extensive discussion (much of it reported in previous MSN coverage of the GeoSurf conference and the Malibu City Council-elect tour of the facility) by Malibu and Topanga activists concerned about the health of the lagoon and the nature of the Tapia discharge was that Torres recommended a gathering of state and county agencies and local organizations to address these concerns.

Torres told the critics to "use my name on your package" and see if they can get on the agenda of the RWQCB's Dec. 3 meeting. Every speaker was asked their position on reopening the Tapia permit process, including Susan McCabe, testifying as chair of the public advisory committee of the Santa Monica Bay Restoration Project, who, unbeknownst to Torres, served as consultant to LVMWD when it achieved its expansion permit.

McCabe, who no longer represents LVMWD, told The News she did not understand

why "Torres just picked up the ball on Tapia and ran with it." McCabe said the SMBRP could serve as a consensus building tool in areas of conflict, but added she wasn't certain how well it would operate when it got down to some of the more heated differences.

The inability of any body or group to bring both the public and private concerns into one arena prompted Torres to say, "We need somebody that everyone's afraid of to bring everybody together...to avoid always having to deal with the 'that ain't my problem' mentality."

California Coastal Commission member Madelyn Glickfeld agreed with Torres, saying, "There has been a lack of leadership on non-point and point source pollution...nobody's in charge."

Torres summed up his concern and the reason behind local hearings: "We have to get people communicating...there has been no true dialogue and without this dialogue, nothing can be accomplished."

-- Anne Sobik

Front PAGE

Pipeline Break Sends Oil Spill to Malibu's Shores

Locals and oil company officials alike appeared to be breathing a collective sigh of relief that a Saturday night spill of a diesel-like oil mixture appeared by mid-week to have been

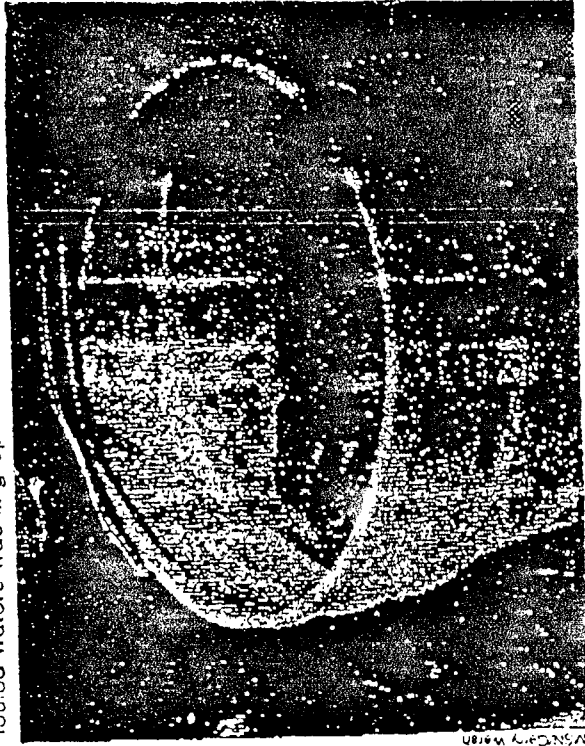
checked as much as possible. The spill of more than 21,000 gallons of the light fuel mixture from a pipeline ruptured by a tanker attempting to dock off El Segundo spread north to Malibu

waters before booms and berms put a stop to the front of thin film.

Even those who didn't see the rainbow-colored sheen with their own eyes — it was often visible



SAD ENDING -- One of many birds found dead in the petroleum fouled waters washing up on Malibu beaches.



ANOTHER STATISTIC -- A dead bird is packaged to be sent to marine biologists for study only when hit directly by sunlight, it



DIFFICULT TASK -- Members of the Chevron Wildlife Care Team transport oil-soaked birds from Surfrider Beach to an aid station.



GRIM OUTLOOK -- Representatives of Chevron study the Malibu coastline to determine the extent of



ANOTHER STATISTIC -- A dead bird is packaged to be sent to marine biologists for study

only when hit directly by sunlight, could determine its presence by the powerful petroleum-like smell.

As Chevron spokespersons minimized the potential effects of the spill on local beaches, several hundred workers wearing yellow rain gear worked at cleaning up affected areas.

The greatest concern was Malibu Lagoon, which small amounts of the foul-smelling film had penetrated, but it appeared to be protected from major intrusion by the public and private multi-agency cleanup effort.

There is still no final tally on the known number of sea birds affected by the spill. Reports of disoriented gulls, pelicans, grebes and loons continued to be reported by beachfront residents as Malibu Surfside News went to press.

One beach dweller told The News that a young sea lion surfaced on the rocks below her home and appeared to be wheezing and trying to clear its eyes. The animal later swam away.

Humans also appeared to continue to feel respiratory side effects from the pervasive fumes. Assurances that the effects would be transitory did not appear to lessen some of the complaints.

Although the spill may have amounted little more than 500 bar-

rels of a distillate mix, it was more than enough to galvanize local environmental activists.

Just last month at its regular board meeting, the Malibu Township Council has voted its opposition to a request by Chevron, U.S.A., scheduled for hearing at the April 11 California Coastal Commission meeting, for permission to run 130 more tanker trips along the south coast.

"This incident should show people how important it is to prevent that approval from being granted," said Sara Wan, MTC vice president and chief environmental spokesperson.

Wan said, "This spill was nothing compared to what a ruptured tanker could do, spewing hundreds of thousands of gallons of oil through our waters." She stressed that, even with a small spill, "There's no such thing as cleanup. This stuff does not go away."

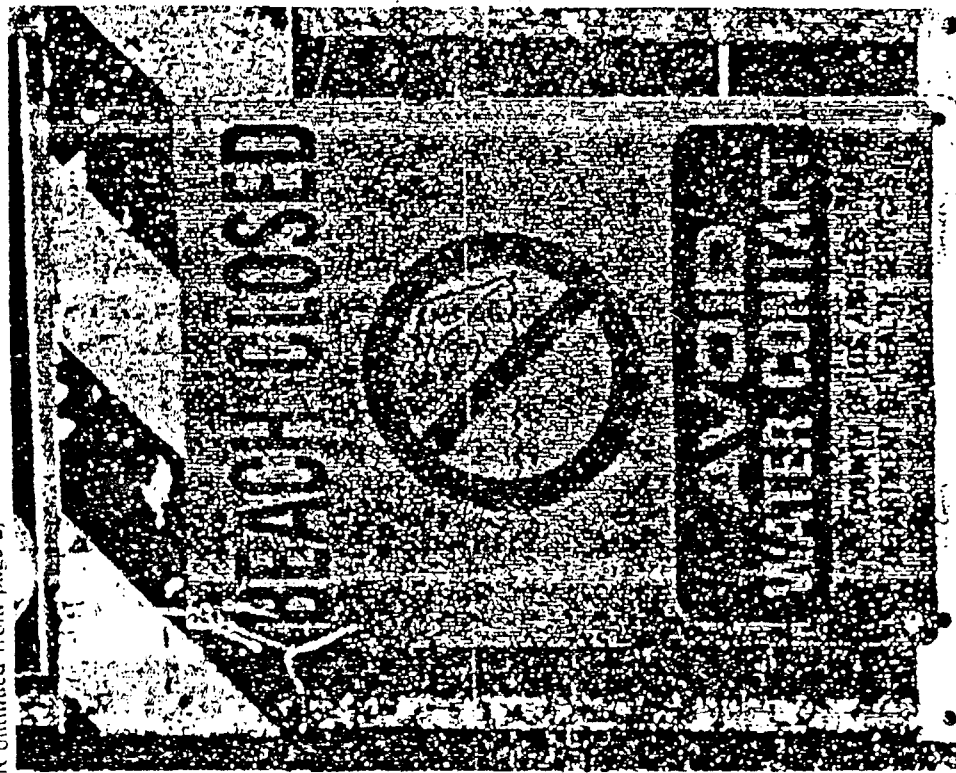
The MTC activist said the group hopes to rally enough interest to underwrite the cost of a bus to take people to the CCC meeting, which will be held in Santa Barbara. Those interested in more information can call 456-6605

Wan said Chevron "is openly lobbying everyone and anyone

(Continued on page 14)

Oil Spill

(Continued from page 2)



LA COUNTY
BEACHES & HARBORS
SAYS IT ALL. Sign posted on Malibu Beach warns swimmers of danger from fuel-mix tainted water

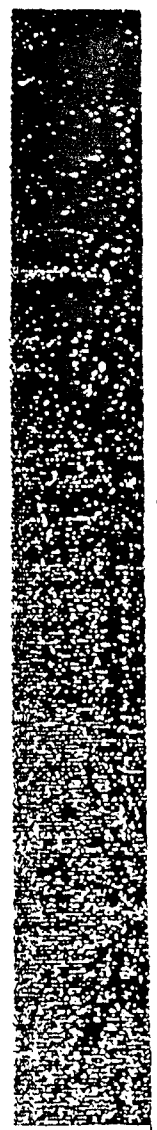
with possible influence on the tankering off the coast, which commissioners. It's imperative that there be people on the other side of this issue speaking out. "If the [Chevron] request is approved, it will open the flood gates to even more requests Exxon is on the line next, and [if also approved], we'll see major

The Malibu City Council-elect indicated its concern about the matter at Tuesday's meeting and will take a stand at next week's meeting.

-- Anne Soble



AILING ANIMAL -- A beachfront resident observed this young sea lion crawl up the rocks, wheeze and trying to clean out its eyes, probably irritated by the oil spill. A while later it swam away



The Malibu Times

Thursday, March 21, 1991

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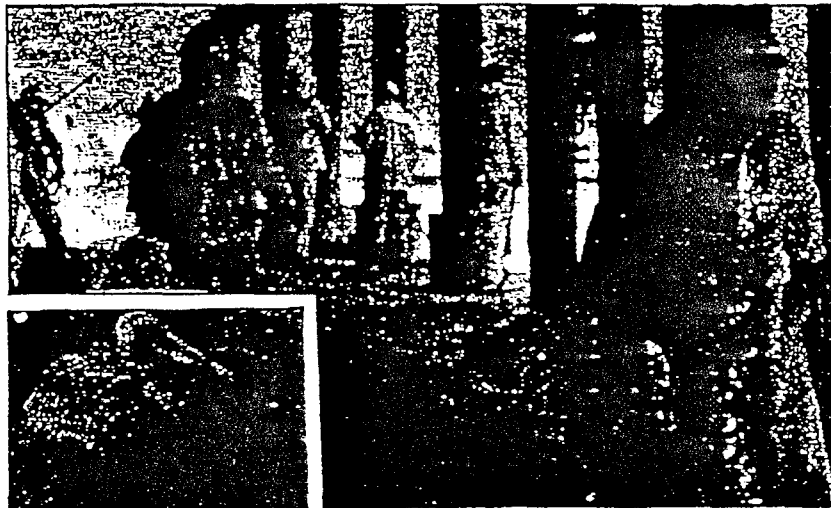
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Workers clean petroleum spill debris under Malibu Pier; an oil-soaked pefican awaits cleaning.

Long-term effects of oil spill weighed

County officials say fuel 'dissipated'; environmentalists wary of the future

By Chris Ford
 Staff Writer

Surfrider Beach was re-
 opened Tuesday morning after
 27,500 gallons of petroleum
 spilled from a pipeline near El
 Segundo had apparently dis-
 sipated, according to county

Heal the Bay's plans for Malibu, B6

officials, while one environ-
 mental official called the spill
 a "serious setback to Santa
 Monica Bay."

A petroleum product simi-
 lar to diesel fuel spilled into
 Santa Monica Bay around
 7:30 p.m. Saturday after a 26-
 inch pipeline operated by San
 Francisco-based Chevron
 USA and located offshore
 from El Segundo was rup-
 tured by a contract ship's
 anchor, according to Chevron.

Adi Liberman, executive
 director of Heal the Bay in
 Santa Monica, said he was
 "deeply disappointed" by the
 spill, which "is a serious
 setback to Santa Monica
 see Spill, page A9



Oil-absorbent cloths were used in cleanup efforts.

Tanker plan opposed

Chevron, USA faces
 opposition next month when
 its application to the Cali-
 fornia Coastal Commission
 to tanker oil from Santa
 Barbara to Long Beach is
 heard.

The Malibu Township
 Council has agreed to oppose
 the application when it is
 heard in April in Santa
 Barbara, according to MTC
 Vice President Sara Wan.

MTC agreed at its last
 meeting to oppose the
 application, Wan said.

"One good tanker spill
 and the years of fighting
 against the Malibu sewer
 would be meaningless," Wan
 said Monday, following the
 Chevron spill that reached
 Malibu Lagoon.

She said she is working
 with various environmental
 see Chevron, page A9

City sea up

By Chris Ford
 Staff Writer

The Malibu
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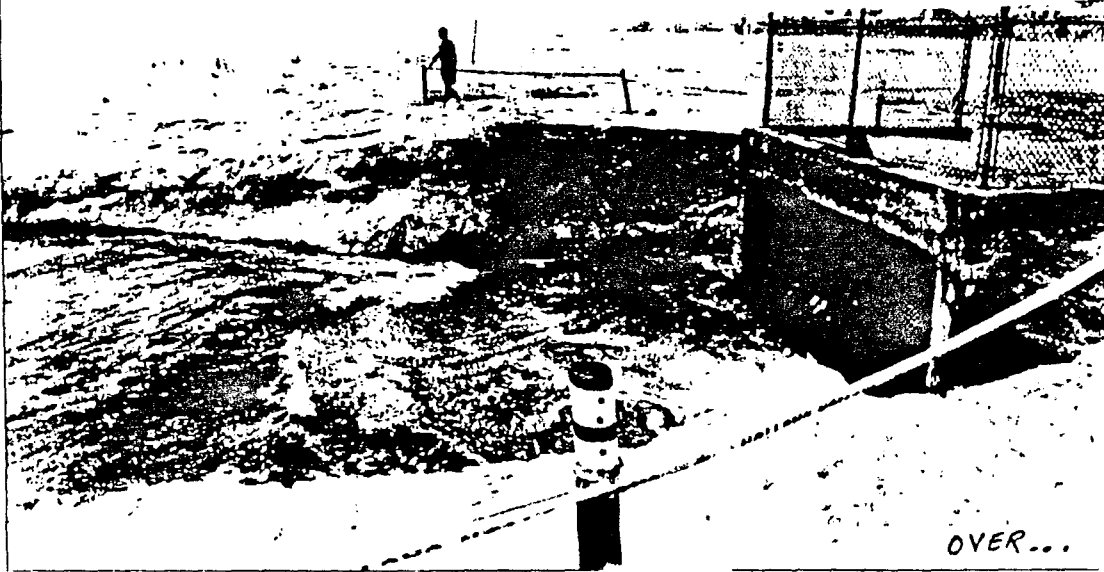
A recruitee
 see 1

Cove residents
 'back to square one'

Change-up; batter up

South Bay News

The storm drain at Herondo Street empties raw sewage into the ocean in southern Hermosa Beach. The drain is one of three areas of Santa Monica Bay where human viruses were detected in a recent study. Although some experts say the water is unsafe for swimmers and surfers, others disagree and say precautions lessen the risk.



To Swim or Not to Swim? L.A. TIMES 6-28-92

■ **Environment:** A new study finds human viruses at Malibu Lagoon and local drains. Beach-goers and experts disagree on whether the waves are worth the risk.

By GEORGE HATCH
TIMES STAFF WRITER

On summer evenings after returning home from work, environmental lawyer Bob Sulnick and several of his Santa Monica Canyon neighbors used to tramp down to the beach for some body surfing.

Today the group that called itself the Dolphin Club is disbanded, done in by concern about the pollutants that storm drains and sewer lines pour into Santa Monica Bay.

"After we started finding out what was going on in the bay, it was a real shock let me tell you," said Sulnick, 49. "We all stopped. I just won't swim anymore off these urban beaches."

Compare Sulnick's view to that of lifeguard Steven Wood of Manhattan Beach. Wood, also 49, has swum and surfed in Santa Monica Bay since the seventh grade. He said he stays at least 100 yards away from flowing storm drains and doesn't swim at all after heavy rains—but otherwise sees no reason to stop going in the ocean.

The only scientific evidence I have is myself, Wood said. "I rarely get infections. My eyes and ears work perfectly. I might be a perfect example that the water quality here is not that bad."

Witnessing a tide of troubling reports about marine pollution in recent years, Santa Monica Bay beach goers increasingly find themselves weighing whether or not to swim.

More such information emerged Friday with the release of a study by the Santa Monica Bay Restoration Project, a publicly funded consortium comprising environmentalists, government regulators and sewage officials.

The study detected viruses that confirmed the presence of human feces in Malibu Lagoon and at two storm drains, the Herondo Street



Swimmers in Santa Monica Bay may be exposed to bacterial contamination and human viruses from storm drain runoff.

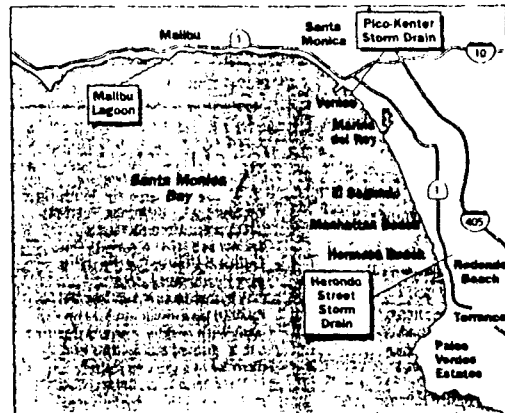
Sulnick, think that local waters are not worth the risk, forswearing swimming except in less populated places. Others, such as Wood, believe that precautions suffice.

Whatever the decision, it is clear that for many, environmental worries have intruded on the once-pristine experience of an ocean plunge.

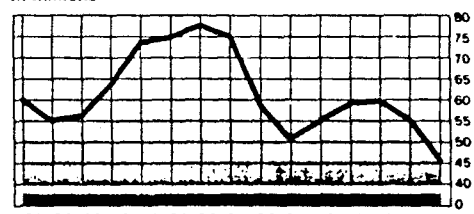
"I think it's fine to swim occasionally, but I don't feel as safe as I used to," Susan Pearce, 30, a Torrance hospital worker, said as she watched a niece and two nephews playing at the water's edge in Hermosa Beach last week. "Everybody I know is tentative about it. It's

Down the Drain

Scientists investigating a lagoon and two storm drains leading to Santa Monica Bay have found viruses that can cause infections in humans. The study comes amid a noticeable slide in beach attendance over the last seven years. Coastal experts disagree on the principal cause of the decline, pointing to public concern about ocean pollution, changing weather patterns and worries about skin cancer.



Beach Attendance In millions



Study: Human waste viruses in storm drains

By Katherine A. Schmidt

Viruses from human waste may be being emptied into Santa Monica Bay, a study released Friday by the Santa Monica Bay Restoration Project suggests.

The study found human viruses in samples taken last year from Santa Monica's Pico Kenner storm drain, the Malibu Laguna, and the Herondo storm drain in the South Bay. This was the first time human viruses were found outside the Pico Kenner drain.

"Finding viruses means we're finding definitively, without a doubt, that there's human sewage in the storm drains," said Mark Gold, one of the report's authors. "Before, we were saying that Pico Kenner was the black sheep of storm drains, but it seems contamination by humans is higher than we thought."

A second part of the study found that levels of bacteria at Santa Monica Beach decreased after a 600-foot pipe was added to the Pico Kenner drain. Since Memorial Day, all of the water that formerly flowed from the drain has been diverted to the Hyperion sewage treatment plant.

In samples taken from June through October 1991, the research team found Coxsacke B viruses, which can cause nausea and rarely, inflammation of the linings of the heart and brain.

"It's really irrefutable that there's a health risk posed by eating replicating filtered sea viruses," said Gold, staff scientist with the environmental group Heal the Bay. The group is one of 34 organizations and government agencies that make up the restoration agency.

A county health official played down the results.

Finding viruses means we're finding definitively, without a doubt, that there's human sewage in the storm drains.

— Mark Gold.

One of the report's authors said there's still nothing to indicate there's a hazard, said Jack Petralia, director of environmental health for the county Department of Health Services. He based his assessment on the regular bacteria counts from samples at county beaches.

But Gold noted that the bacteria for which the county tests can come from any warm-blooded animal. Public health officials do not test specifically for human viruses because it is too expensive, and it takes from one to three months to detect them.

The highest levels of viruses were found at the Pico Kenner and Herondo drains, Gold said. The Herondo drain is between Hermosa Beach and Redondo Beach.

The study did not trace the source of the viruses, but indicated they could come from leaking septic tanks, illegal sewer connections, or homeless people and campers. Studies in the previous two years failed to find viruses at Santa Monica's Ashland storm drain, at Ballona Creek, and at

VIRUSES 82

Viruses

FROM PAGE B1

the beach near the Santa Monica Canyon drain. But Gold said that's not necessarily cause for concern.

"To say we didn't find anything doesn't mean it wasn't there, it means the method wasn't able to detect it," Gold said.

Catherine Tyrrell, the agency's executive director, said the group's first priority will be to find a way to trace the sources of the contamination. The restoration project's management committee also approved in concept a resolution that includes investigating the health risks associated with various levels of water quality, and developing ways to find human disease-causing agents. Malibu residents said the study backed up their longstanding claim that swimmers at Surfdrifter Beach have been getting sick when Malibu Laguna is breached.

"This is no news to local surfers," said David Saitonip, president of the Surfdrifter Foundation, Malibu chapter. "They've been getting sick with water with ear, nose and throat infections, skin rashes and flu symptoms for years." No studies have been done on swimmers at Surfdrifter Beach or elsewhere in the Santa Monica Bay.

Heal the Bay released a study on Memorial Day showing that bacterial contamination at some county beaches exceeds public health standards more than half the year.

SOUTH BAY NEWS

WATER: Study Washes in New Concern About the Bay

Continued from B3

ing attention paid in recent years to the disposal of treated sewage in Santa Monica Bay. But the biggest focus of concern is runoff, the grisly mix of water and urban detritus that flows into the bay through storm drains extending as far as Agoura Hills.

Experts say the runoff, which is untreated, carries contaminants ranging from animal droppings to anti-freeze to pesticides—pollutants that become especially worrisome when rains wash large amounts of them into the sea.

In the study by the Santa Monica Bay Restoration Project, scientists found evidence suggesting that human feces might also be entering numerous storm drains. The information is significant because human feces sometimes contain enteric or intestinal viruses that can cause health problems ranging from stomach flu to dysentery and respiratory problems.

In two previous Restoration Project investigations, enteric viruses were detected in only one place: the Pico Kenner drain. But in the latest study, biologists with the City of Los Angeles, the Orange County Sanitation Districts and the environmental group Heal the Bay, tested three drains—and found the human viruses in all three.

"This shows that Pico Kenner is not the black sheep storm drain," said Heal the Bay biologist Mark

Gold, a co-author of the report. "In fact, this might be indicative of the storm drain situation throughout the region."

Because the study could not gauge what quantities of human waste are entering the drains, the magnitude of the public health risk posed by the runoff is uncertain. But the mere presence of the viruses is cause for concern, the study's authors said.

Charles McGee, a biologist with the Orange County Sanitation Districts, said, "The problem with viruses is that it only takes one to cause an infection."

Sulnick, executive director of the American Oceans Campaign, a Santa Monica environmental group, said the virus study reinforces his resolve to swim only in ocean waters beyond Malibu Laguna.

With Los Angeles County already subject to toxic chemicals in the air, he said, swimming where toxins may be present in the water could add to long-term health risks. Then there are the short-term health problems he added, saying his group receives calls from many people who blame the bay for a range of ailments.

"We hear about skin rashes, caracases, eye infections," Sulnick said. "What I say is that they have to make their own decision. It's sad, but we all have to."

A poll released last week sug-

gests that for many Angelenos the decision is to stay out of the water. In a survey of 500 Los Angeles County residents, the Restoration Project found that 55% of bay visitors said they do not enter the water mostly because of pollution concerns.

However, many experts said residents do not have to give up swimming off local beaches—among them, Los Angeles County health officials and experts from the Bay Restoration Project and Heal the Bay.

Paul Papanek, a county epidemiology expert, said that by staying at least 100 yards from flowing storm drains and not swimming for three days after heavy rains, people face the same risk of ingesting a harmful virus as they would "going to the corner diner."

"It's not like people should say, 'Oh my God, the minute I put my toe in the water or dunk my head in, I'm in trouble,'" Papanek said. "This beach protocol gives people a reasonable protection from risks."

Even some of those who claim that the bay affects their health say they are reluctant to leave the water. One is Andrew Gushiken of Redondo Beach, chair of the South Bay chapter of Surfdrifter Foundation, an environmental group made up of surfers.

"I have the occasional eye infec-

tion and the occasional ear infection and some fevers that don't seem to make sense," said Gushiken, a 34-year-old engineer. "But I love surfing and I guess that's the price I have to pay."

Gushiken said staying out of the water amounts to throwing in the towel. "One response is to say, 'Oh, this beach is dirty I won't go anymore,'" he said. "But a better one is to say, 'I'd like to continue going here and make sure it's clean enough to do so. That makes a statement.'"

Numerous experts said a key step toward addressing the beach pollution issue would be to launch an epidemiological study to determine how the ocean affects the health of those who swim in it.

The Santa Monica Bay Restoration Project is looking into the feasibility of such a study. But some in the group said they question whether the study could produce statistically valid information—and believe that the \$1 million to \$2 million it would cost could be put to better use, said Catherine Tyrrell, the project's director.

Other steps that must be taken, Tyrrell said, include new studies to find the sources of storm drain pollution and projects to prevent the contamination.

Some of these projects are underway. Since Memorial Day for in-

stance, Santa Monica has been sending runoff from the Pico-Kenner drain to the Hyperion sewage plant in Playa del Rey for treatment. "This will only take place during dry times, however, when flows are not too heavy for Hyperion to handle."

The Bay Restoration Project said more than 60% of those interviewed in its poll said they would back a bond issue to finance coastal

pollution control projects on the Hermosa Beach shore last week. Terrance resident Chaim Palman offered cautious support for that view.

"If I was sure it would be managed well, I'd probably say yes," the 37-year-old engineer said, eyeing the surf as he sat on a beach towel. "I feel we really should do more because this is a wonderful resource."

A New Wave of Dissension Over Sewage Treatment Site

■ **Environment:** Critics say the Tapia Water Reclamation Facility may be responsible for viruses and bacteria in the ocean nearby.

MALIBU
By JEFF KRAMER
TIMES STAFF WRITER

Six miles up Malibu Creek, a world away from where the surfers play, a small reclamation plant quietly goes about the business of turning brown sewage into clear water.

By the time the malodorous mess—bubbling merrily through a series of concrete chambers—is released into Malibu Creek, it will be clean enough to swim in, at least by federal standards.

Continued from J1

and making them sick

- A study recently released by the Santa Monica Bay Restoration Project, a government-funded regional environmental group, has lent credibility to surfers' medical complaints, confirming the existence of hazardous bacteria and human fecal viruses in Malibu Creek, Malibu Lagoon and the surf.

- The city of Malibu shows signs of flexing its jurisdictional muscle. A legal exploration, requested by the City Council, has determined that the city has the authority to take measures to block Tapia from contaminating local waters.

Tapia is run by the Las Virgenes Municipal Water District, which covers a 122-square-mile area that includes Calabasas, Agoura Hills, Eden Hills, Westlake Village and incorporated sections of Los Angeles County. Malibu does not contribute sewage to the facility.

What remains unclear is whether the plant—recognized in 1988 by the Environmental Protection Agency for excellence in operation and maintenance—is actually responsible for any of the viral and bacteriophages present in the water.

The Tapia plant provides a five-stage treatment process for sewage that includes filtration and treatment with chlorine.

Las Virgenes officials say this so-called tertiary treatment process produces water that is cleaner than federal standards require. They argue that the plant has been targeted for criticism largely because it is the most easily identifiable source of water entering the creek.

State regulators last year increased the plant's permit to dump treated effluent into Malibu Creek from 10 million gallons per day to 16 million gallons. It now sends out 7 million gallons per day into the creek.

It's easy to blame a single entity, said Las Virgenes spokeswoman Ane Deister. "It's difficult to deal with the possibility that it may be hundreds or thousands of individual inputs that are causing the problem."

No one disputes that animals, agricultural runoff, storm drains, homeless people and other sources may be contributing to the contamination.

Also, a Texaco station next to Malibu Lagoon has a permit to pump up to 360,000 gallons of water daily as part of its cleanup of a gasoline leak there.

Las Virgenes officials say the question of who is responsible for the pollution won't be answered conclusively until a thorough source study is conducted, a stance opposed by Jeff Harris, an activist in the environmental groups in the Bay and Environment

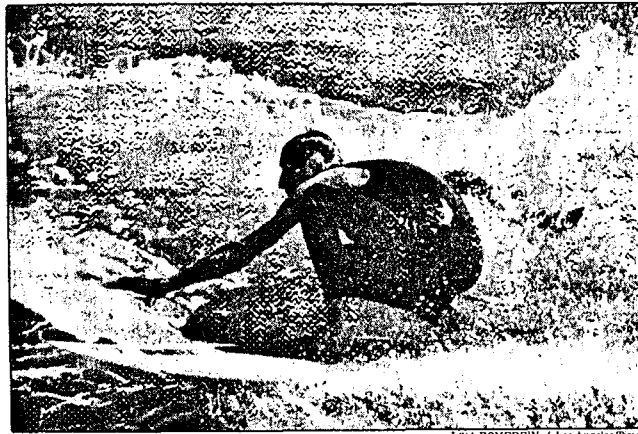
It's technically clean according to the Clean Water Act," he said. "The research question is whether the standards are high enough."

"The Tapia plant is an excellent plant," said Richard A. Harris, a state regulator.

That view is not widely shared in Malibu. After nearly two decades of friction between the environmentally minded community and operators of the Tapia Water Reclamation Facility, the relationship appears to be hitting a new low this summer.

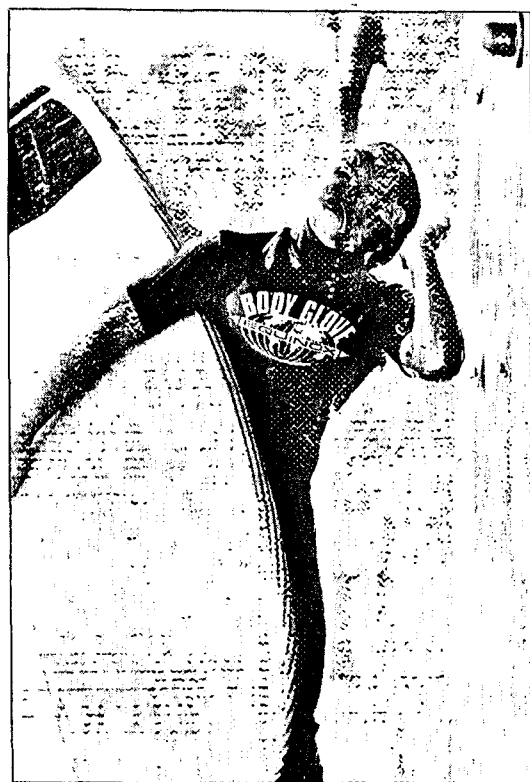
- Surfers, turning up the heat in their lengthy battle against Tapia, have staged a round of angry protests and canceled an international competition at Surfrider Beach, claiming microorganisms are escaping from the facility's treatment process.

Please see TAPIA, J5



LISA ROMERIN / Los Angeles Times

Surfer rides wave off Malibu Lagoon, where bacteria and viruses have been detected.



LISA ROMERIN / Los Angeles Times

Josh Farberow, 18, washes off after surfing at Malibu Lagoon.

But some say the issue has been studied to death. Citing several nationally recognized studies that prove viruses can escape some forms of tertiary treatment, Mary Frampton, executive director of the local environmental group Save Our Coast, accused Jeff Harris of being too easy on Tapia and of overlooking what she considers conclusive data on hazards associated with tertiary-treated sewage.

Frampton acknowledged that the incidents of ailing surfers are anecdotal, but she added, "When you get hundreds of them saying they've had ear infections, eye infections, internal upsets and even worse, then you know what you're doing is criminal. If a terrorist were doing this to visitors and swimmers, he'd be in jail for a long time."

Microbiologist Dr. James Grimes, now with the U.S. Department of Energy, has spent 11 years studying the effectiveness of reclamation plants in removing microorganisms. He has concluded that viruses often escape tertiary treatment and links the problem largely to the use of chlorine as a disinfectant.

Although he has not studied Tapia specifically, Grimes said many plants use less chlorine than is needed to kill microorganisms

because of dangers associated with excessive chlorine use. One is that chlorine can combine with organic compounds to form carcinogens such as chloroform.

"Most plants do not chlorinate sufficiently to remove all the pathogens," Grimes said.

Gastrointestinal viruses are among the most common in treated sewage, but more serious strains have been isolated as well. A University of Florida study last year reported the presence of HIV—the AIDS virus—in treated effluent from a Florida plant, although the test did not show whether the virus was infectious.

Grimes added that there's never been a documented case of anyone contracting AIDS from tertiary-treated sewage effluent. And Kent McLain, general manager of the Las Virgenes district, stressed that tests of Tapia's effluent have never detected viruses of any kind.

To further allay concerns, Las Virgenes district is spending \$100,000 on sophisticated "gene probe" testing—said to be the best method available for detecting viral agents in effluent.

Some Malibu residents say they don't trust the plant to test itself, and others point to the broader

issue of whether Tapia should be allowed to dump any amount of water into the creek, no matter how clean.

Stating a widely shared opinion in Malibu, Grimes said: "My own personal bias is that treatment plants shouldn't be releasing effluent into coastal recreation areas. They're contradictory uses."

Jeff Harris of Heal the Bay agreed, noting that the dumping creates a breeding ground for bacteria by altering the natural habitat of the lagoon and the stream, which would normally run dry for much of the year.

"People concentrate on whether Tapia is the source [of the microorganisms] and other issues get neglected," he said. "These other things are real clear-cut and real detrimental."

"Tapia will just tell you: 'We meet the [federal] Clean Water Act, we're not the problem.' But they are creating part of the problem with their discharges," he added.

Richard Harris, the regulator with the California Water Quality

Control Board, countered that high levels of development in the area make it likely the stream would run year-round even without Tapia's contribution.

"They've always hated the fact there's a treatment plant there," Richard Harris said of Malibu's environmental groups. "If the plant weren't there, there'd still be water in Malibu Creek."

In exchange for Tapia's commitment to gene probe testing, three of the groups—Environment Now, Heal the Bay and the Natural Resources Defense Council—have agreed not to try to get the plant's dumping permit thrown out.

Only Save Our Coast refused to sign the pact, charging the other organizations with cozying up to the treatment plant.

SOC's Frampton—accusing Heal the Bay's Jeff Harris of selling out the anti-Tapia movement—said she was "furious with him."

"I think he's just decided to go along, get along," she said.

He responded with a call for coordination and cooperation. "I'm not interested in creating factions," he said. "We need as broad a coalition as possible."

City officials, meanwhile, are still digesting a legal opinion concluding that Malibu would be on legally defensible ground were it to pass an ordinance or take some other measure to stop Tapia's discharge.

The key in court, said Mayor Walter Keller, would be if Malibu could prove damages.

So far, the city is proceeding slowly. Last week, the City Council tabled Tapia-related resolutions from Jeff Harris and Save Our Coast in favor of organizing a meeting between Malibu and Las Virgenes officials.

"We have to take this step by step or they'll fight us all the way," Keller said.

SOUTHERN CALIFORNIA

California No. 1 in beach closures

Environmental group says most caused by bacteria

By Keith Stone 7-24-92
Daily News Staff Writer

California led the nation in beach closures last year — mostly between San Diego and Malibu — because of sewage spills that boosted bacteria levels to unhealthy levels, an environmental organization reported Thursday.

Beach closures and warnings hit a three-year high nationwide with at least 2,000 in 1991, according to the Natural Resources Defense Council, which urged creation of a daily water quality index similar to the smog index.

California beaches were closed 745 times in 1991, more than any of 22 coastal states surveyed, the private, nonprofit group reported. Of those closings, 588 occurred between Malibu and San Diego.

"There is a significant problem with coastal pollution in California," said Defense Council spokeswoman Ann Notthoff.

The Defense Council believes California should close beaches when bacteria levels exceed standards for reasons including sewage spills and storm drain runoff, Notthoff said.

"Even though they may be

testing, they don't close the beaches unless there is a sewage spill," she said.

Los Angeles County officials said beachgoers are protected adequately from polluted water.

"If there is a problem, people will not be allowed to go in the water or they will be warned," said Larry Charness, chief of planning for the county Department of Beaches and Harbors.

Singling out Los Angeles County for its high number of closings is not fair, he said, because the county tests more vigilantly and therefore uncovers more problems.

"It is unfair to penalize us for doing a good job," he said.

Swimming in water that contains high levels of bacteria can cause eye and ear infections and flu-like symptoms including vomiting, diarrhea, nausea, headaches, stomach pain and fever.

In a related development Thursday, Malibu-based Environment Now reported that ocean samples taken near Latigo Creek in Malibu contained bacteria that could cause cholera, a fatal disease.

While Los Angeles County officials determine whether the

ocean sample contained the bacteria responsible for epidemic cholera, they said that section of Malibu beach would remain open.

"It is unlikely it is the epidemic type," said Dr. Ellen Alkon, medical director for public health at the county Department of Health Services. There have been no reported cases of cholera contracted through ocean water in the county, she said.

Environmental activists said that finding such bacteria in the water underscores the need for consistent testing, uniform standards and stepped-up efforts to stem pollution.

Even with California's high number of beach closings, it remains unclear how its water quality compares to other states because there is no uniform standards for measuring it, Notthoff said.

"As a result, we can't be sure the waters we are swimming in are safe," Notthoff said. "People should have the option to avoid those risks."

The Defense Council called for a national beach protection policy to set uniform standards and

TESTING THE WATER:

In 1991, California led 22 coastal states with 745 beach closures or advisories against swimming because of high levels of bacteria, according to a report by the Natural Resources Defense Council. Among other findings:

■ A majority of 1991 beach closures in California — 588 — occurred between Los Angeles and San Diego. The beaches were closed, with one exception (an "unknown" source) — only when high bacteria levels were linked to sewage spills.

■ San Diego, Orange and Los Angeles counties had more 1991 beach closures than any area of equivalent size in the nation.

■ The major causes of high bacteria levels in beach water are: inadequate and overloaded sewage treatment systems, combined sewer overflows, raw sewage overflows, poison runoff, faulty septic system and boating wastes.

■ There are no uniform nationwide bacteria standards or testing procedures to protect swimmer safety. In addition, there are no federal requirements that the public be notified when water quality standards are violated.

■ The Defense Council recommends adoption of a National Beach Protection Program, which includes: a nationwide water quality standard; comprehensive monitoring of ocean and bay beaches and public notification whenever water quality standards are violated.

SOURCE: Natural Resources Defense Council

require immediate beach closures when those standards are not met.

The Defense Council also called for an index that would alert beachgoers daily to the quality of water at specific beaches.

Los Angeles County's coastal waters are tested at least weekly in nearly 30 locations along 31 miles of beach from San Pedro to Malibu. Beaches are closed immediately after sewage spills or when bacteria levels consistently exceed standards, Charness said.

Charness said he would support a water quality index only if scientists could agree on a set of standards with proven links to health risks.

Surfers to test for coastal pollution

Group to monitor 60 Southern California sites

By Warren Robak
STAFF WRITER
News Pilot
NP 9/24/92

Challenging the notion of surfers as water-logged Neanderthals, an environmental group kicked off a program Wednesday to enlist surfers in a yearlong effort to test the Southern California coastline for pollution.

The Surfrider Foundation, founded eight years ago to turn surfers into advocates for a clean ocean, has trained hundreds of its members to perform simple laboratory tests to look for bacterial contamination at popular surfing spots.

Organizers say the program is designed

to enhance water quality sampling done by government agencies. They hope the surfers' efforts will provide a better picture of the role storm drains play in polluting local coastal waters.

And it just may change the way people view surfers.

"We are fighting the image that surfers don't have the brain power to test the water," said Scott Jenkins, the Surfrider Foundation's environmental director and a research engineer at Scripps Institute of Oceanography in La Jolla.

"It doesn't take a rocket scientist to test

the water," he said.

Speaking during a news conference on the sand in Hermosa Beach, Jenkins said the foundation is looking for volunteers to help conduct testing three times a week at 60 popular surfing sites stretching from Santa Barbara to the Mexican border.

"The program is designed to give anyone who wants to have an involvement with the environment a chance to help," Jenkins said.

The 24,000-member organization spent more than a year experimenting with a simple screening test in which water samples are collected in small vials and incu-

SURFERS/A9

Surfers

FROM PAGE A1

bated overnight to test for coliform bacteria, which indicates the presence of human fecal contamination.

The method is not approved by agencies such as the U.S. Environmental Protection Agency. But the Surfrider program will use EPA-approved tests in areas where initial samples show the presence of pollution.

At the end of a year, the Surfrider Foundation will compile results and forward them to government agencies along with recommendations.

"Our goal is not to close California beaches. That happens often enough," Jenkins said. "But we have the right to know what we are surfing and swimming in so we can evaluate the risks."

Jenkins said the areas where testing is needed most are off San Diego and Santa Barbara. The Los Angeles coastline is already heavily tested.

Testing is done at 17 sites each day by the city of Los Angeles and at 32 sites weekly by county health officials.

"I think we have a pretty good picture of what is going on," said Jack Petralia, director of environmental protection for the county Department of Health Services.

People interested in taking part in the testing effort or in purchasing a testing kit for \$25 can telephone the Surfrider Foundation, (800) 743-SURF.

Water, traffic, open space top Malibu priorities

Survey lists residents' goals

By Katharine A. Schmidt
STAFF WRITER

What do Malibu residents want most for their city? Clean creeks, a free-flowing highway, fewer visitors, no tacky signs and lots of open space.

Those were the top choices in a survey released recently by the city's General Plan Task Force. The city polled 5,800 property owners by mail, and received 406 responses.

The answers echoed concerns Malibu residents have expressed since their quest for local control led to cityhood a year and a half ago.

The survey is meant to guide members of the task force as they write the general plan that will govern Malibu's develop-

ment into the next century. "I wasn't at all surprised to hear what the big important issues were," said Councilman Jeff Kramer.

He said he had heard the same concerns during his run for city council in April, when a hard-line, slow-growth faction overturned the council majority.

Water pollution remains the top priority, as it was when cityhood proponents fought a county plan for a sewage treatment plant.

More than 95 percent of respondents agreed that the city should use its power to prevent pollution of creeks, lagoons and the ocean.

Malibu has already prepared

a Wastewater Management Plan, and last month signed a contract to begin writing ordinances to carry it out.

Pacific Coast Highway rated nearly the same response as water pollution, with 94 percent of those surveyed urging the city to lobby Caltrans to improve safety and traffic flow.

Accordingly, 79.2 percent thought the city should work with cities on the other side of the Santa Monica Mountains to cut recreational traffic to Malibu's beaches. Residents also thought, by a margin of 72 percent, that the city doesn't need any more services for visitors.

In their daily drive along the highway, residents want to see fewer signs of the type that crowd the area near the Malibu pier.

More than 80 percent said

they want to see the city improve the look on Pacific Coast Highway by regulating the size and design of signs outside businesses.

For now, the city has an interim ordinance regulating new signs.

"People are very much against gaudy, ugly signs," said Russ Wolpert, chairman of the General Plan Task Force. "Billboards really detract from the appearance of the neighborhood."

Residents overwhelmingly expressed their desire for wide open vistas in other responses supporting "rural, open space character of the community," and protection of public and private views of the ocean, canyons and mountains.



FREDERICK M. BROWN/STAFF PHOTOGRAPHER

Signs of the times in Malibu aren't popular with many residents, who say they would like limits on size and design.

Park Service Takes Aim at a Killer Plant

■ **Environment:** The exotic foliage has been smothering native flora. Last week, a crew was sent in to get to the root of the problem.

By CAROL CHASTANG
TIMES STAFF WRITER

LA Times 1/7/93

A broom from Spain is sweeping through the Santa Monica Mountains, and it's leaving an environmental mess. But the National Park Service is striking back, attacking Spanish broom, an exotic plant that is killing off native flora, at the roots. Last week, seven inmates from a juvenile probation camp took up hatchets and "weed wrenches" to chop, hack and yank the plants from a rugged hillside a few miles south of Agoura Hills.

It was the first government-sponsored attack on Spanish broom, so named because it resembles a dried broom shoved handle first into the earth.

"It's displacing the natives," said Rose Rumball-Petre, a park resource management specialist with the park service. As tall as it is resilient, Spanish broom crowds out such plants as yucca and also blocks out the sun, killing off surrounding—and shorter—natives. "In other words, it's smothering the other plants," she said.

Spanish broom, or *Spartium juceum*, was introduced to the region's mountain ranges by Spanish settlers in the 1700s to control erosion.

Many California native grasslands in the region, Rumball-Petre said, are slowly disappearing in the 150,000-square-acre Santa Monica Mountains National Recreation Area that extends from Pt. Mugu in the north to Griffith Park in the south.

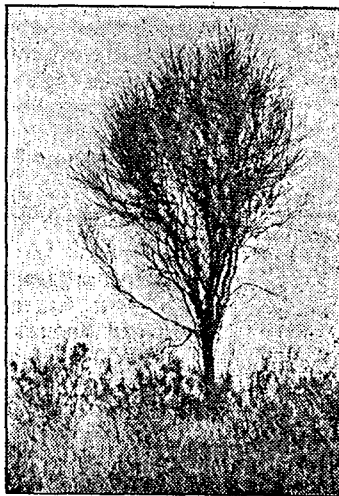
"We're here to preserve and protect the plants by removing the Spanish broom," Rumball-Petre told a crew from Camp Miller, a Los Angeles County Probation Camp for juveniles in Malibu, who gathered on a cold, bright morning. "I think it's important to know why you are here," she added, concluding her pep talk.

She then showed the young men, who were wearing yellow hard hats, sweat shirts and jeans, how to use the weed wrench, a long pole with a clamp on its curved end that relies on leverage to pull the plant from the ground, often with the roots intact.

"Why can't we just chop them down?" asked Raul, a 17-year-old crew member. She explained that chopping would take too long and was too tiring. And the roots must be



Spanish Broom



Spartium juceum is an almost leafless shrub that reaches a height of six to 10 feet. All parts of the plant, which blooms with yellow flowers, are poisonous if eaten. It is prevalent on dry slopes in the eastern Santa Monicas.

Rose Rumball-Petre, a park resource management specialist with the park service, explains the fine points of Spanish broom removal to the seven-man crew.

removed to prevent the plant from growing back.

Then the teen-agers got to work.

The day before the inmates arrived, probation officer Frank Miller explained what their task would be. "Some of them complained, asking 'Why do we have to do this?'" he said. "They think it's some sort of punishment."

Most of Thursday's crew did not show much enthusiasm, but one said he would like to come back as a volunteer after he completes his sentence at Camp Miller.

About 200 square feet of park land shrouded by Spanish

Please see PLANTS, J7



TODD BIGELOW / Los Angeles Times

Inmates from Camp Miller, a juvenile probation camp, hack at the "alien" Spanish broom near Kanan Dume Road.

PLANTS: Many Native Grasses Victimized by Exotic Foliage

Continued from J1
 oom were cleared in three days. For the trained eye, to see native grasses poking out again, I can't tell you how wonderful that is," Rumball-Petre said. She conceded that although the work crew removed mounds of the unwanted, new ones will sprout up as seeds are scattered by animals or the wind.

Some non-native plants can be burned or poisoned, but those options were rejected for Spanish broom, said David Gackenbach, superintendent of the Santa Monica Mountains National Recreation Area. It was feared that herbicides would harm other plants, and fire is ruled out because the location, near Kanan Road and Mulholland

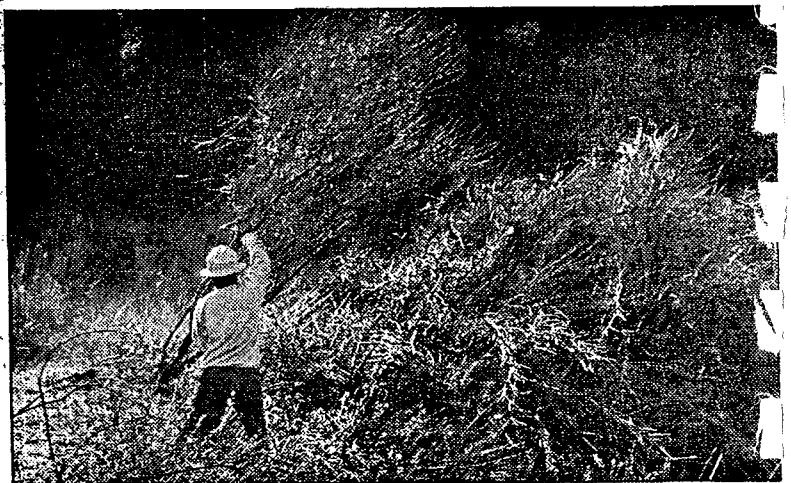
Highway, is not far from some houses.

Carlos, 17, had never been to the

'To see native grasses poking out again, I can't tell you how wonderful that is.'

ROSE RUMBALL-PETRE
Resource Management Specialist

Santa Monica Mountains before his stint with the Camp Miller work crew. "I like working out here, cleaning up," he said. On his second



TODD BIGELOW / Los Angeles Times

A worker adds more Spanish broom to the pile of extracted plants

day pulling up Spanish broom, he said he had mastered the technique. "If you do it any old way, you could be here all day long," he

"You gotta look for the right way said, looking over at fellow crew members struggling to pull the plant out with their hands. I learned fast."

Daily News 8.15.93

Malibu pollution concern grows



Phil McCarten/Daily News

Children at Malibu Lagoon warn of possible storm drain contamination, but the placid, warm water remains a favorite play area for children

Health hazards to beachgoers unclear

By Tony Knight
Daily News Staff Writer

Like many children, 11-year-old Veronica Quinonez enjoys swimming in the warm, shallow Malibu Lagoon in spite of a sign that says, "Caution: Storm Drain Water and Surf May be Contaminated. No Swimming."

"I like it here because it's warm," said the North Hollywood girl, pointing across the sandy

berm that separates the quiescent lagoon from world famous Surfrider Beach. "Out there, you go under the waves."

At a nearby lifeguard tower, guards Steve Snyder and Kip Jerger watch swimmers and surfers in the ocean, paying little attention to the people playing in the lagoon.

"We do not enforce the no-swimming sign," Snyder said. "When we're questioned, we do

warn of the potential hazard. It's just a warning from the county to swim at your own risk."

A recent study found bacteria and viruses in the lagoon and in the nearby surf, including those associated with sewage, but failed to assess the human health threat.

The study raised concerns but left unanswered the question of whether it is safe to swim at Surfrider Beach, one of the world's premier surfing spots, offi-

cialists said.

Surfers and lifeguards say they believe they are getting infections from the water. While some doctors acknowledge that this could be possible, they say there is no proof that any health problems are related to water-borne germs.

"The problem is that our methodology is totally inadequate to make that connection between the

presence of an organism in the surf zone and the manifestation of illness in a person," said Rainer Hoenicke, environmental specialist with the state Regional Water Quality Control Board.

But with health complaints mounting and environmentalists demanding answers, several public agencies have plans to spend more than \$700,000 on studies designed to trace the sources of pollution at Surfrider Beach, Malibu Lagoon and Malibu Creek — and to assess the possible health threat.

"We have wave after wave of surfers coming to meetings, and we keep hearing the same things," said state Coastal Commission member Madeline Glickfeld, a Malibu resident. "Even though the agencies don't have the data to back these things up, I think we have a problem there."

Studying the watershed

Four major studies and several other inquiries are targeting the 110-square-mile Malibu Creek watershed, which stretches inland to include the communities of Las Virgenes, Agoura Hills, Calabasas, Westlake Village and part of Thousand Oaks — making it the most studied watershed in Southern California, officials said.

"I think part of the reason is that it's the last major relatively undeveloped watershed in the region," said Robert Ghirelli, executive officer of the regional water board. "We want to pull together as much information as we can about the watershed and use that to develop a comprehensive watershed plan."

The wide array of studies during the next few years is expected to involve a record number of investigators from a variety of disciplines.

Geneticists will study the chromosomes of bacteria and viruses found in the waters and attempt to grow the germs on animal tissue.

Epidemiologists plan to track illnesses among beachgoers.

Biologists will study the habits of rare fish such as the tidewater goby and the state's southernmost run of steelhead trout.

And public works engineers will seal smoke bombs in storm drain outlets and then walk the streets and alleys to find openings where the smoke comes up in an effort to determine where pollutants might go down.

"There's just so much going on you can't believe it," said Ane Deister, director of resource conservation for the Las Virgenes Municipal Water District, which is funding the gene probe study. "We want to find out absolutely the most information that we can."

Ocean pollution requires an assessment of the the entire watershed because the sources are so varied, officials say.

Possible sources

Disease-causing germs could be coming from a restaurant parking lot or gas station in Agoura Hills, from septic tanks in Malibu Canyon, from picnickers at Tapia County Park, from homeless encampments near the Malibu civic center or from storm drains and septic tanks near the beach.

Environmentalists and surfers said they hope the studies determine how safe the water is, identify and eliminate sources of pollution and lead to a better warning system

for swimmers.

Because the studies will look at pollution coming from upstream communities, at the operations of the Tapia Water Reclamation Plant in Malibu Canyon and at such practices as horse keeping and soil tilling, they are expected to have even broader impacts on land use and development throughout the watershed.

"In the long term, we do intend to impact both land use and natural resources policies," said Calabasas City Councilman Dennis Washburn, who is also chairman of the Topanga-Las Virgenes Resource Conservation District, which is doing the comprehensive natural resource study of the watershed.

Malibu Lagoon contains a mixture of various types of water that flow in Malibu Creek, including natural springs, imported water used for lawn care and effluent from the Tapia plant.

Often during winter storms the flow in Malibu Creek is strong enough to breach the sandy berm protecting the lagoon. But even in calm weather when the lagoon rises to a level that could cause storm drains to back up, state parks workers mechanically breach the lagoon.

At that point, the pent-up and often stagnant waters flow into the surf zone, causing a dark stain that invades the waves at Surfrider Beach. Surfers and others in Malibu suspect this is the source of much illness among ocean swimmers.

"The whole issue of the lagoon, and when and how it ought to be breached, is going to be dealt with (in the studies)," Ghirelli said. "Until then, we have to acknowledge the fact that these pathogens are there and certain precautions have to be taken when you're swimming around these areas."

Signs ignored

But even with signs warning against swimming in the lagoon, children and adults continue to play there.

Jose and Maria Lopez of Los Angeles sat with their four children in the lagoon waters last Sunday, building a sand castle a few feet from a warning sign.

"He doesn't like to go in (the surf)," Jose Lopez said of Jose Jr. "I know it looks bad, the water, but I don't know how dangerous it is."

Neither does anyone else, said Mark Gold, staff scientist for the environmental group Heal the Bay, and co-author of a key study funded by the Santa Monica Bay Restoration Project, a consortium of public agencies and environmental groups organized by the federal government to address pollution problems in the bay.

The restoration project study released last year found bacteria and viruses in the lagoon and surf zone that could pose a human health threat. The study also found evidence of human pathogens in two storm drains that empty into the bay.

"Everywhere we looked we were finding human enteric viruses," Gold said. "That meant somehow, some way, sewage was getting into the storm drain system."

But Gold acknowledged the study established only the presence of the organisms but did not address whether there was a real health threat.

"We're still not any closer to answering the question, is it safe to

swim in Santa Monica Bay," he said.

Virus may hit heart

Among the study's most controversial discoveries in the lagoon waters was a virus known as Coxsackie B. The virus is found in human sewage and can cause gastrointestinal infections and, in rare

cases, attack the human heart.

The study's release last summer caused a scare among surfers and led to an agreement between the county and environmental groups to post warning signs on the beach whenever the sandy berm protecting the lagoon is breached.

System warning bathers of water danger called ineffective



Rand McClain surfs regularly at Malibu Lagoon, near Surfrider Beach



Jose and Maria Lopez spend a day at Malibu Lagoon with their four children. A recent study found bacteria and viruses in the lagoon.

Phil McCarten/Daily News

Studies to try to find source of germs flowing into ocean

MALIBU / From Page 12

Harris and Gold said the state should publish notices before the lagoon is breached and the county health department should regularly publish results of weekly water sampling.

Seek warning system

State parks officials said they were working with surfers on a flag system to warn of lagoon breaches and the direction of current flows.

Petralia said he was reluctant to mail or publish sampling results, although he acknowledged the information is public record.

"The data isn't clear," he said. "There are times when we just scratch our heads sometimes and say we don't know what it means. I don't want to be in a position every week of having to justify why we didn't do something on the basis of one fluky sample."

Gold said the only way to put the health issue to rest is to do a complete epidemiological study, and Petralia said he fully supports doing such a study.

Efforts are under way in the state Legislature to fund a \$1.2 million study of swimmers in the near-shore zone, Gold said. A broader study of surfers is not planned at this time, he said.

Other major studies that are funded or under way include a major effort to quantify natural resources and environmental problems in the Malibu Creek watershed. The Topanga-Las Virgenes Resources Conservation District and the U.S. Soil Conservation Service are involved in the two-year effort. It is designed to form the foundation of a Watershed Management Plan, will cost \$450,000 and be completed by December 1994.

By then, most of the other studies should be complete, and the watershed plan will incorporate their findings as well, said Soil Conservation Service engineer Stan Moorehead, the study team leader.

Another study is being mounted by the Santa Monica Bay Restoration Project, which announced a challenge grant of \$50,000 in 1991 and succeeded in rounding up another \$70,000 to look at pollution in Malibu Creek and Lagoon with a variety of studies.

Monitoring bacteria

The Las Virgenes Municipal



M.ung J. Chun/Daily News

Erik Villanueva recovers from a second heart transplant earlier this month. He blames ocean pollution for a virus that ruined his heart.

Water District will spend \$130,000 on an enhanced pathogen monitoring study that will examine the genetic material of bacteria and viruses found in the lagoon, and it will investigate whether microbes are present in the Tapia sewage treatment plant effluent.

The state Coastal Conservancy is planning a \$120,000 study of the lagoon and the practice of digging a trench to breach the sandy berm, allowing pent-up creek waters into the ocean.

The regional water board is conducting a series of one-day intensive sampling surveys in an effort to get a snapshot of water quality throughout the creek at any one time.

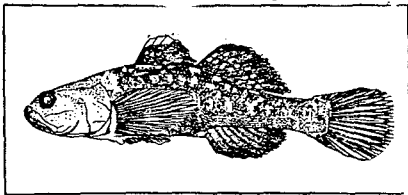
The city of Malibu is trying to discover the source of storm drain

waters flowing into the creek and lagoon and to determine whether septic systems in Malibu Colony are leaking.

The inland watershed cities and Los Angeles County are preparing to control their storm drain pollutant loads and to investigate septic problems in the mountain areas.

The state Department of Parks and Recreation is conducting a study of wetlands and wildlife management in the lagoon and lower creek.

The Chevron Oil Co. has agreed to fund a \$50,000 pilot epidemiological study to track illness among beachgoers throughout the bay. The pilot study will develop a model for a full-blown, \$1.2 million epidemiological study being proposed by environmentalists if state funding is available.



The two-inch goby is threatened by increased salinity brought on by breaching

Small Fish May Play Big Part in Fate of Lagoon

ATimes 3-27-94

■ **Environment:** The goby is getting star treatment. Activists predict its inclusion on the federal endangered species list will be the impetus for cleaning up the water near Malibu Creek.

By KATHLEEN KELLEHER
SPECIAL TO THE TIMES

It is a tiny, unremarkable fish that feeds off microorganisms at the bottom of estuaries. But the unsung goby, environmentalists predict, just might provide the impetus for a solution to the decade-long controversy over how to clean up and restore Malibu Lagoon.

In the month since the goby was added to the federal endangered species list, residents, surfers, environmentalists and government agencies have been waiting to see how the U.S. Department of Fish and Wildlife plans to ensure the survival of the two-inch-long fish, which lives and breeds in the brackish, polluted lagoon.

To maintain the goby's habitat, the state Department of Parks and Recreation is expected to adopt the fish and wildlife department's guidelines.

The plan is expected to call for strict regulation of mechanical breaching of a sandy berm that separates the lagoon from the ocean. State parks department employees bulldoze sections of the berm when the lagoon water reaches the brim so that septic tanks that feed into the lagoon do not back up.

But breaching the berm can harm the goby because the practice upsets the balance of salt and fresh water in the lagoon.

The guidelines, due in a few months, probably won't include recommendations to eliminate the lagoon's bacteria and disease-causing microorganisms because such pathogens have been found to not harm the goby.

Environmentalists nevertheless are optimistic that the goby may indirectly help the movement to clean up the lagoon.

If closely regulated breaching can be achieved to protect the goby, the thinking goes, then clearing the bureaucratic wrangling among government agencies that has blocked the cleaning up of the lagoon can't

Please see GOBY, 4

GOBY: Species May Have Impact on Lagoon

Continued from 3
be far behind.

"I think the [federal endangered species] listing is going to be the driving force and catalyst to get restoration going," said Mark Gold,

scientist for Heal the Bay. "Hopefully it will also get us off the dime to clean up the storm drain run-offs"

The goby has disappeared from half of California's few remaining

wetlands and has been listed as a "state species of special concern" by the state Fish and Game Department for more than five years. Tidewater goby live in estuaries from Humboldt to San Diego counties, where, according to C. Brown, a wildlife biologist with the U.S. Department of Fish and Wildlife, they are in imminent danger of extinction.

The goby died off in the lagoon in the 1960s when the dredging of Malibu Creek and bulldozing of the upper lagoon for flood control covered the course, sandy bottom of the lagoon with sediment, destroying the goby's nesting area, said Sean Manion, an ecologist with the Topanga-Las Virgenes Resource Conservation District.

In April, 1991, Manion, using a \$18,000 state parks department grant, reintroduced 52 goby to the Malibu Lagoon. They have reproduced to 500.

"People say, 'What is so special about the goby?'" Manion said. "It's just one more cog in the wheel of biodiversity interconnected to all other species ecologically, including man. The fear ecologists have is that you take a species out and there will be an environmental ripple effect or a cascade of extinctions to follow."

The lagoon, located at the mouth of Malibu Creek at Surfrider Beach, has been polluted by treated sewage flowing in from the Tapia Water Reclamation Plant along the creek as well as pesticides and human and animal waste from communities upstream.

Still, the pollutants have had little effect on the goby, whose worst threat is the rapid increase in water salinity brought on by breaching.

Parks employees began bulldozing the berm in 1983 after Malibu residents complained that their septic tanks were backing up. The berm is breached whenever the water level of the lagoon reaches 3.5 feet above the average low tide, Manion said.

Surfers, or "the shovel brigade," as they have been nicknamed, dig out their own break to avoid natural breaching, which occurs in the middle of Surfrider Beach's long wave break.

Some environmentalists believe surfers pose the greatest threat to the goby.

"It's a bad situation," said Rainer Hoenecke, a scientist for the Santa Monica Bay Restoration Project. "You are going to have to keep an officer posted there to keep surfers from shoveling out breaks."

The Malibu Times

XLVIII No. 20
Thursday, May 19, 1994

Creek clean-up plan hits snag

By Anita Stephens
Staff Writer

One of the priority actions recommended by the Santa Monica Bay Restoration Project to clean up the Malibu Creek watershed may be shelved because of a disagreement between a property owner and a government agency.

The Topanga-Las Virgenes Resource Conservation District has a \$50,000 grant from the Environmental Protection Agency and \$100,000 of donated labor from Caltrans to reestablish a wetland on the west bank of Malibu Creek just north of the Pacific Coast Highway bridge. The plan includes removing the asphalt and rip-rock placed on the creek bank by the property owners, the Adamson family.

The Adamsons withdrew their permission to have the rock and asphalt removed because they fear it will destabilize the bank and possibly cause flooding in the nearby Cross Creek shopping center. They say they could be liable if flooding occurs.

"The creek has meandered since the '50s," said Adamson family spokesperson Sharon Cree, "but it hasn't moved since my former husband put rock on the bank about 10 years ago. I feel badly that these people have put a lot of time and effort into this

project, but what they plan is totally inadequate."

City of Malibu public works director John Clement said in an interview that the creek bank should be stabilized with boulders.

Parking lot planned?

TLVRCD Vice President David Gottlieb said that the stream bank restoration has been well planned and that Adamsons don't want the wetland restored because they have plans to build a parking lot there.

"The stream bank restoration and reinforcement plan has the blessing of the Soil Conservation Service engineers and has been well-planned and well-engineered. The whole project has been extremely well thought out and engineered for safety and environmental concerns," Gottlieb said.

"If the Adamsons think that they are going to get permission for increased beach parking on this specific property, they should rethink their expectation because that would be a direct threat to water quality in the lagoon," Gottlieb added. Cree indicated the family currently has no specific development plans.

The parties were still in negotiation at press time. Restoring the west bank of Malibu creek is one of 67 priority actions in the Santa Monica Bay

See Creek, page A11

Creek

From page A1
Restoration Project to clean up groups.
Santa Monica Bay

The \$5 million project devotes an entire chapter to restoration of the Malibu Creek watershed, a 105-square-mile area that extends as far back into the mountains as Thousand Oaks and drains into Malibu Lagoon.

But all the actions require cooperation among the involved parties, and in some cases there are federal, state and local agencies, private property owners and environmental groups with a vested interest in a particular project.

Regulating the water level in Malibu Lagoon is a priority project in the SMDRP and is likely to stir up controversy among many

polluted lagoon regularly into the ocean at Surfrider Beach. The lagoon water, known by experts to contain bacteria and viruses, is dunned by a sandbar. When the water level in the lagoon gets too high, the sandbar is bulldozed, some mentalists say, because septic systems in Malibu Colony reportedly do not function properly at high water levels.

"If the Adamsons think that they are going to get permission for increased beach parking on this specific property, they should rethink their expectation . . ."

DAVID GOTTLIEB,
VICE PRESIDENT
TOPANGA-LAS VIRGENES
RESOURCE CONSERVATION
DISTRICT

Our Coast oppose the installation of a pipe that would continuously drain the lagoon and, according to activist Mary Frantpton, would make the creek "one long outfall pipe."

She said she would like to see the water cleaned before it gets to the lagoon. In February, another player entered the fray — the U.S. Fish and Wildlife Service — when the tidewater goby, a two-inch fish that lives in the lagoon, was put on the endangered species list.

The SMDRP has plans that may help clean creek water before it enters the lagoon and the ocean. Los Angeles County Department of Health Services will spend \$180,000 to inspect wastewater treatment systems and septic systems in the areas around the lagoon. The Los Angeles Regional Water Quality Control Board will divvy \$106 million among 10 cities for the inspection of allegedly illicit connections to storm drains.



ALAN J. DUGNAN / Los Angeles Times

Lee Kats of Pepperdine University measures a California newt. The lizard could hold clues to ecological damage in Malibu area.

When No Newts Isn't Good News

By PENELOPE MOFFET
SPECIAL TO THE TIMES

Crouched on a rock slab high in the Cold Creek Canyon Preserve near Malibu, Pepperdine University student Seth Gamradt scoops up an orange California newt that has just snagged a large, struggling spider in the creek.

The newt tries to swim away from Gamradt, but moves too slowly. Its half-drowned prey floats downstream, where it is retrieved by Pepperdine natural sciences professor Lee Kats.

"Newts are basically scavengers," said Kats, marveling at this newt's ambition. "They're not good at catching true aquatic prey, so they hope things fall into the water." To catch a spider, he said, is beyond most newts' dreams.

It was a dramatic moment for Kats, 31, who has studied the newts and tree frogs at Cold Creek for four years.

Now, in the wake of the November wildfires, which torched the preserve, ecologists' interest in the tiny creatures has increased as they study how the California newts survived the fire and what clues they may offer about the overall health of the Santa Monica Mountains.

"More than most amphibians, [the newts] utilize both aquatic and terrestrial habitats," Kats said. "Given that amphibians have such sensitive skins, they're very good indicators about anomalous substances in soil and water. If [newts are] around, it's a good indicator that the health of the land and water is pretty good."

The preserve, which reopened in mid-May, is lush with new growth and there appears to be an abundance of newts.

Last winter, Kats wondered if the creek's newt population was wiped out by the fire. That would have been a great loss since little is known about this newt species, one of three found in the state and the only one in Southern California.

But this winter and spring, adult newts made their normal migration from land to the stream in numbers close to previous years, Kats has learned. Because they survived the fire, Kats said, "this really tells us these animals are probably at least a foot underground" when on land.

Kats' research indicates that newt populations elsewhere in the mountains have been greatly reduced over the last several years, mainly because they are preyed on by such creatures as bullfrogs, crayfish and mosquito fish not found in Cold Creek. Development and the proliferation of hiking trails have also disturbed their habitat.

Although the skin of adult newts contain a powerful toxin that makes them an unpalatable meal, their nontoxic eggs and larvae are eaten by many creatures.

And though newts may be abundant at Cold Creek, there is uncertainty about the future. The stream was severely affected by the fire's aftermath, with most of the deep pools that newts prefer for mating and egg-laying filled with silt.

As a result, only half the normal number of eggs have been laid this spring and "the females are laying eggs in very peculiar places," Kats said.

"Normally, you wouldn't see them lay eggs in anything less than three feet of

water. Now they're laying eggs in pools only six or seven inches deep. That's risky, if [the pools] dry out" before the fishlike larvae can transform to newts.

Lately, the newts have had one stroke of luck—plenty of earthworms washing downstream with the silt. To a hungry newt, "there's nothing better than a drowning earthworm," Kats said.

When he encounters a newt at Cold Creek, Kats sometimes "squirts" a little water down its esophagus to force the contents of its stomach up. He bags the contents and takes it back to the lab for analysis.

The procedure gives a newt just "a little bit of a bellyache," Kats said, but "ecologically it tells us a lot."

This year, Kats has been finding earthworms, not newt eggs, in the animals' stomachs, indicating that cannibalism has not been occurring.

"Newts are not good at capturing fast-moving prey, so their preferred prey is slow-moving," Kats said. "Egg masses have filled that role in the past. We think in years when the earthworms are not there they're making the best of the situation. This year they have other options."

Peter Morin, a Rutgers University biology professor, has called Kats' work on cannibalism among newts "cutting-edge" and "fascinating."

Tiny California tree frogs, another native, are also still abundant at Cold Creek. "My best hunch is they were actually in the water" when the fire roared by, Kats said.

APPENDIX III: Summary Tables of stations and parameters

Waterbody Location	Malibu Ck Dorothy Drive	Malibu Ck Malibu Cyn rd	Malibu Ck Malibu Cyn rd	Malibu Ck Malibu Cyn rd	Malibu Ck Malibu Cyn rd	Malibu Ck Malibu Cyn rd	Malibu Ck below Rindge Dam	Malibu Ck below Rindge Dam
Station ID	R-1 ENHANCED	R-2*	R-2 ENHANCED	R-2 ENHANCED	R-2 ENHANCED	R-2 ENHANCED	R-3	R-3 ENHANCED
Agency	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD
CI number	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760
Type of sample	fish tissue	surface water	surface water	sediment	fish tissue	surface water	surface water	surface water
CONVENTIONAL								
Total flow			weekly					weekly
Water level								
Temperature		weekly	weekly			weekly		weekly
pH		weekly	weekly			weekly		weekly
Turbidity		monthly	monthly			monthly		monthly
Color quantitative		monthly	monthly			monthly		monthly
Total suspended solids		monthly	monthly			monthly		monthly
Total dissolved solids								
Settleable solids		monthly	monthly			monthly		monthly
Dissolved oxygen		weekly	weekly			weekly		weekly
Chloride			monthly					monthly
Sulfate								
COD								
BOD		monthly	monthly			monthly		monthly
Residual chlorine		monthly				monthly		
Boron		annually				annually		
Fluoride		annually				annually		
Alkalinity								
Hardness								
Bocarbonate								
Specific conductivity								
Calcium	annually			annually		annually		
Magnesium	annually			annually		annually		
Sodium	annually			annually		annually		
Potassium	annually			annually		annually		
Carbon dioxide								
Salinity			weekly					weekly
NUTRIENTS								
Nitrate		monthly	monthly			monthly		monthly
Nitrite		monthly	monthly			monthly		monthly
Nitrate + Nitrite								
Ammonia		monthly				monthly		monthly
Organic nitrogen		monthly	monthly			monthly		monthly
Total nitrogen								
Phosphate		monthly	monthly			monthly		monthly
BACTERIA/VIRUS								
Coliform Group								
Coliform total		weekly	weekly			weekly		weekly
Coliform fecal								
K/ streptococcus								
Enterococcus			weekly					weekly
C jejuni								
Enterococcus E Coli								
Shigella								
Salmonella								
Vibro parahemo								
METALS								
Barium								
Beryllium								
Lead	annually			annually		annually		
Cadmium	annually			annually		annually		
Cobalt								
Chromium (VI)								
Total Chromium	annually			annually		annually		
Copper	annually			annually		annually		
Nickel	annually			annually		annually		
Zinc	annually			annually		annually		
Arsenic								
Mercury	annually			annually		annually		
Selenium	annually			annually		annually		
Silver	annually			annually		annually		
Aluminium								
Manganese								
Iron								
Cyanide								
ORGANIC CHEMICALS								
Certain chemicals								
MBAs		monthly	monthly			monthly		monthly
Oil and grease		monthly	monthly			monthly		monthly
Organic chemicals (see note 1)								
Total petroleum hydrocarbons								
Total organic carbon								
Volatile organic chemicals (see note 2)								
poly aromatic hydrocarbons					annually			
PESTICIDES								
Chlorinated pesticides					annually			
PCBs								
VISUAL OBSERVATIONS								
Flow estimate		weekly				weekly		weekly
Water odor		weekly	weekly			weekly		weekly
color		weekly	weekly			weekly		weekly
turbidity		weekly	weekly			weekly		weekly
Storm runoff		weekly				weekly		weekly
Floating solids		weekly	weekly			weekly		weekly
Sludge, oil, foam		weekly				weekly		weekly
Tide and wind		weekly				weekly		weekly
Aquatic plants		weekly				weekly		weekly
Unusual occurrence		weekly				weekly		weekly
Algae growth		weekly	weekly			weekly		weekly
Mosquitos, gnats, black flies		weekly	weekly			weekly		weekly
ID fish			weekly			weekly		weekly
Sediment Char			weekly			weekly		weekly
Photo algae		weekly	weekly			weekly		weekly
MISCELLANEOUS								
Transparency								
Transmissivity								
Toxicity-fathead minnow								
Chronic toxicity								
Sensitive species								
3 species								
96 hour in-situ fish bioassay		quarterly	quarterly			quarterly		quarterly
Radioactivity								
EPA priority pollutants (note 3)								
Large scale fish seine or trawl		annually	semi-annually			annually		annually
Benthic infaunal								
Other								
Total solids								
Volatile solids								
Volatile suspended solids								
Cation exchange capacity								
Total sulfides								
Sed grain								
Footnote								
Footnote2								

* Only sampled if dischr*Mar - Sept
001 is in use

Waterbody Location Station ID Agency CI number Type of sample	Malibu Ck below Rindge Dam R-3 ENHANCED LVMWD CI 4760 sediment	Malibu Ck Cross Creek Rd R-4 LVMWD CI 4760 surface water	Malibu Ck Cross Creek Rd R-4 ENHANCED LVMWD CI 4760 surface water	Las Virgenes Ck above discharge 001 R-6* LVMWD CI 4760 surface water	Las Virgenes Ck above discharge 001 R-6 ENHANCED LVMWD CI 4760 surface water	Las Virgenes Ck 200' d/s of R-6 R-7* LVMWD CI 4760 surface water	Las Virgenes Ck 500' d/s of R-7 R-8* LVMWD CI 4760 surface water
CONVENTIONAL							
Total flow			weekly		weekly		
Water level							
Temperature		weekly	weekly	weekly	weekly	weekly	weekly
pH		weekly	weekly	weekly	weekly	weekly	weekly
Turbidity		monthly	monthly	monthly	monthly	monthly	monthly
Color quantitative		monthly	monthly	monthly	monthly	monthly	monthly
Total suspended solids		monthly	monthly	monthly	monthly	monthly	monthly
Total dissolved solids							
Settleable solids		monthly	monthly	monthly	monthly	monthly	monthly
Dissolved oxygen		weekly	weekly	weekly	weekly	weekly	weekly
Chloride			monthly		monthly		
Sulfate							
COD							
BOD		monthly	monthly	monthly	monthly	monthly	monthly
Residual chlorine		monthly		monthly		monthly	monthly
Boron		annually		annually		annually	annually
Fluoride		annually		annually		annually	annually
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium	annually						
Magnesium	annually						
Sodium	annually						
Potassium	annually						
Carbon dioxide							
Salinity			weekly		weekly		
NUTRIENTS							
Nitrate		monthly	monthly	monthly	monthly	monthly	monthly
Nitrite		monthly	monthly	monthly	monthly	monthly	monthly
Nitrate + Nitrite							
Ammonia		monthly		monthly		monthly	monthly
Organic nitrogen		monthly	monthly	monthly	monthly	monthly	monthly
Total nitrogen							
Phosphate		monthly	monthly	monthly	monthly	monthly	monthly
BACTERIA/VIRUS							
Coliform Group							
Coliform total		weekly	weekly	weekly	weekly	weekly	weekly
Coliform fecal							
Kf streptococcus							
Enterococcus							
C jejuni							
Enterococcus E Coli							
Shigella							
Salmonella							
Vibro parahemo							
METALS							
Barium							
Beryllium							
Lead	annually						
Cadmium	annually						
Cobalt							
Chromium (VI)							
Total Chromium	annually						
Copper	annually						
Nickel	annually						
Zinc	annually						
Arsenic							
Mercury	annually						
Selenium	annually						
Silver	annually						
Aluminium							
Manganese							
Iron							
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBAs		monthly	monthly	monthly	monthly	monthly	monthly
Oil and grease		monthly	monthly	monthly	monthly	monthly	monthly
Organic chemicals (see note 1)							
Total petroleum hydrocarbons							
Total organic carbon							
Volatile organic chemicals (see no							
poly aromatic hydrocarbons	annually						
PESTICIDES							
Chlorinated pesticides	annually						
PCBs							
VISUAL OBSERVATIONS							
Flow estimate		weekly		weekly		weekly	weekly
Water odor		weekly	weekly	weekly	weekly	weekly	weekly
color		weekly	weekly	weekly	weekly	weekly	weekly
turbidity			weekly		weekly		
Storm runoff		weekly		weekly		weekly	weekly
Floating solids		weekly	weekly	weekly	weekly	weekly	weekly
Sludge, oil, foam		weekly	weekly	weekly	weekly	weekly	weekly
Tide and wind		weekly	weekly	weekly	weekly	weekly	weekly
Aquatic plants		weekly	weekly	weekly	weekly	weekly	weekly
Unusual occurrence		weekly	weekly	weekly	weekly	weekly	weekly
Algae growth		weekly	weekly	weekly	weekly	weekly	weekly
Mosquitoes, gnats, black flies		weekly	weekly	weekly	weekly	weekly	weekly
ID fish			weekly		weekly		weekly
Sediment Char			weekly		weekly		weekly
Photo algae		weekly	weekly	weekly	weekly	weekly	weekly
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity-fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay		quarterly		quarterly		quarterly	quarterly
Radiactivity							
EPA priority pollutants (note 3)							
Large scale fish seine or trawl		annually		annually		annually	annually
Benthic infaunal							
Other							
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides							
Sed grain							
Footnote				* only sampled if discharge		* only sampled if discharge	* only sampled if discharge
Footnote2				002 is in use		002 is in use	002 is in use

Waterbody Location	Malibu Ck u/s confluence Las Virg	Malibu Ck u/s confluence Las Virg	Malibu Ck R-10	Malibu lagoon near west shore R-11	Malibu lagoon near west shore R-11 ENHANCED	Malibu lagoon near west shore R-11 ENHANCED	Malibu lagoon near west shore R-11 ENHANCED
Station ID	R-9	R-9 ENHANCED	R-10	R-11	R-11 ENHANCED	R-11 ENHANCED	R-11 ENHANCED
Agency	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD
CI number	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760	CI 4760
Type of sample	surface water	surface water	surface water	surface water	surface water	sediment	fish tissue
CONVENTIONAL							
Total flow		weekly				weekly	
Water level						weekly	
Temperature	weekly	weekly	weekly	weekly	weekly	weekly	
pH	weekly	weekly	weekly	weekly	weekly	weekly	
Turbidity	monthly	monthly	monthly	monthly	monthly	monthly	
Color quantitative	monthly	monthly	monthly	monthly	monthly	monthly	
Total suspended solids	monthly	monthly	monthly	monthly	monthly	monthly	
Total dissolved solids							
Settleable solids	monthly	monthly	monthly	monthly	monthly	monthly	
Dissolved oxygen	weekly	weekly	weekly	weekly	weekly	weekly	
Chloride		monthly				monthly	
Sulfate							
COD							
BOD	monthly	monthly	monthly	monthly	monthly	monthly	
Residual chlorine	monthly		monthly	monthly	monthly		
Boron	annually		annually	annually	annually		
Fluoride	annually		annually	annually	annually		
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium						annually	annually
Magnesium						annually	annually
Sodium						annually	annually
Potassium						annually	annually
Carbon dioxide							
Salinity		weekly				weekly	
NUTRIENTS							
Nitrate	monthly	monthly	monthly	monthly	monthly**	**	
Nitrite	monthly	monthly	monthly	monthly	monthly**	**	
Nitrate + Nitrite							
Ammonia	monthly	monthly	monthly	monthly	monthly**	**	
Organic nitrogen	monthly	monthly	monthly	monthly	monthly**	**	
Total nitrogen	monthly	monthly	monthly	monthly	monthly**	**	
Phosphate	monthly	monthly	monthly	monthly	monthly**	**	
BACTERIA/VIRUS							
Coliform Group							
Coliform total	weekly	weekly	weekly	weekly	weekly**	**	
Coliform fecal							
Klebsiella							
Enterococcus					weekly**	**	
C. jejuni					weekly*		
Enterococcus E. Coli					weekly*		
Shigella					weekly*		
Salmonella					weekly*		
Vibrio parahaemolyticus					weekly*		
METALS							
Barium							
Beryllium							
Lead						annually	annually
Cadmium						annually	annually
Cobalt							
Chromium (VI)							
Total Chromium						annually	annually
Copper						annually	annually
Nickel						annually	annually
Zinc						annually	annually
Arsenic							
Mercury						annually	annually
Selenium						annually	annually
Silver						annually	annually
Aluminium							
Manganese							
Lithium							
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBAs	monthly	monthly	monthly	monthly	monthly	monthly	
Oil and grease	monthly	monthly	monthly	monthly	monthly	monthly	
Organic chemicals (see note 1)							
Total petroleum hydrocarbons							
Total organic carbon							
Volatile organic chemicals (see note 2)							annually
Polycyclic aromatic hydrocarbons							
PESTICIDES							
Chlorinated pesticides							annually
PCBs							
VISUAL OBSERVATIONS							
Flow estimate	weekly		weekly	weekly			
Water odor	weekly	weekly	weekly	weekly	weekly	weekly	
Color	weekly	weekly	weekly	weekly	weekly	weekly	
Turbidity	weekly	weekly	weekly	weekly	weekly	weekly	
Storm runoff	weekly		weekly	weekly	weekly		
Floating solids	weekly	weekly	weekly	weekly	weekly	weekly	
Sludge, oil, foam	weekly		weekly	weekly	weekly		
Tide and wind	weekly		weekly	weekly	weekly		
Aquatic plants	weekly		weekly	weekly	weekly		
Unusual occurrence	weekly		weekly	weekly	weekly		
Algae growth	weekly	weekly	weekly	weekly	weekly	weekly	
Mosquitoes, gnats, black flies	weekly	weekly	weekly	weekly	weekly	weekly	
ID fish		weekly	weekly		weekly	weekly	
Sediment Char		weekly	weekly		weekly	weekly	
Photo algae	weekly	weekly	weekly	weekly	weekly	weekly	
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay	quarterly		quarterly	quarterly			
Radiactivity							
EPA priority pollutants (note 3)							
Large scale fish seine or trawl	annually		annually	annually	annually	annually	
Benthic infaunal							
Other							
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides						**	
Sediment grain						**	
Footnote	#ge				*Mar - Sept	** see note 5	
Footnote2					** see note 5		

	Malibu Ck u/s discharge 001	Malibu Ck d/s discharge 003	Malibu Ck d/s discharge 003	Malibu Lagoon @ mouth	Malibu Lagoon D Channel	Malibu Lagoon D Channel	Malibu Lagoon @ shopping center
Station ID	R-12*	R-13	R-13 ENHANCED	S-1 ENHANCED	S-6 ENHANCED	S-6 ENHANCED	S-7 ENHANCED
Agency	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD	LVMWD
CI number	CI 4760	CI 4760	CI 4760				
Type of sample	surface water	surface water	surface water	surface water	surface water	sediment	surface water
CONVENTIONAL							
Total flow			weekly				
Water level							
Temperature	weekly	weekly	weekly				
pH	weekly	weekly	weekly				
Turbidity	monthly	monthly	monthly				
Color quantitative	monthly	monthly	monthly				
Total suspended solids	monthly	monthly	monthly				
Total dissolved solids							
Settleable solids	monthly	monthly	monthly				
Dissolved oxygen	weekly	weekly	weekly				
Chloride			monthly				
Sulfate							
COD							
BOD	monthly	monthly	monthly	monthly	monthly		monthly
Residual chlorine	monthly	monthly					
Boron	annually	annually					
Fluoride	annually	annually					
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium							
Magnesium							
Sodium							
Potassium							
Carbon dioxide							
Salinity			weekly	weekly	weekly		weekly
NUTRIENTS							
Nitrate	monthly	monthly	monthly		**	**	**
Nitrite	monthly	monthly	monthly		**	**	**
Nitrate + Nitrite							
Ammonia	monthly	monthly			**	**	**
Organic nitrogen	monthly	monthly	monthly		**	**	**
Total nitrogen							
Phosphate	monthly	monthly	monthly		**	**	**
BACTERIA/VIRUS							
Coliform Group							
Coliform total	weekly	weekly	weekly	weekly	weekly**	**	**
Coliform fecal							
K1 streptococcus							
Enterococcus				weekly	weekly**	**	**
C jejuni				weekly*			
Enterococcus E Coli				weekly*			
Shigella				weekly*			
Salmonella				weekly*			
Vibro parahemo							
METALS							
Barium							
Beryllium							
Lead							
Cadmium							
Cobalt							
Chromium (VI)							
Total Chromium							
Copper							
Nickel							
Zinc							
Arsenic							
Mercury							
Selenium							
Silver							
Aluminium							
Manganese							
Iron							
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBA's	monthly	monthly	monthly				
Oil and grease	monthly	monthly	monthly				
Organic chemicals (see note 1)							
Total petroleum hydrocarbons							
Total organic carbon							
Volatile organic chemicals (see note 2)							
polycyclic aromatic hydrocarbons							
PESTICIDES							
Chlorinated pesticides							
PCBs							
VISUAL OBSERVATIONS							
Flow estimate	weekly	weekly					
Water odor	weekly	weekly	weekly				
color	weekly	weekly	weekly				
turbidity							
Storm runoff	weekly	weekly					
Floating solids	weekly	weekly	weekly				
Sludge, oil, foam	weekly	weekly					
Tide and wind	weekly	weekly					
Aquatic plants	weekly	weekly					
Unusual occurrence	weekly	weekly					
Algae growth	weekly	weekly	weekly				
Mosquitoes, gnats, black flies	weekly	weekly		weekly	weekly		weekly
ID fish			weekly	weekly	weekly		weekly
Sediment Char			weekly	weekly	weekly		weekly
Photo algae	weekly	weekly	weekly				
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay	quarterly	quarterly					
Radiactivity							
EPA priority pollutants (note 3)							
Large scale fish seine or trawl	annually	annually					
Benthic infaunal							
Other					bio spec diversity		bio spec diversity
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides						**	
Sed grain						**	
Footnote	* only sampled if discharge			*Mar - Sept	** see note 5	** see note 5	** see note 5
Footnote2	002 is in use						

	Malibu Lagoon @ shopping center S - 7 ENHANCED LVMWD	Ocean S Lagoon mouth B - 1 ENHANCED LVMWD	Ocean N Lagoon mouth B - 2 ENHANCED LVMWD	Reclaimed water In system	Sludge farm Wells	Sludge farm composite sludge LVMWD CI 6430 sludge	Sludge farm composite sludge ENHANCED LVMWD CI 6430 sludge
Waterbody							
Location							
Station ID							
Agency							
CI number							
Type of sample	sediment	surface water	surface water	treated water	groundwater		
CONVENTIONAL							
Total flow				daily			
Water level					monthly		
Temperature							
pH							
Turbidity				daily**	quarterly	quarterly	
Color quantitative					quarterly		
Total suspended solids							
Total dissolved solids				monthly*	quarterly	quarterly	
Settleable solids							
Dissolved oxygen							
Chloride				monthly*	quarterly		
Sulfate				monthly*	quarterly		
COD					quarterly		
BOD					quarterly		
Residual chlorine							
Boron							
Fluoride				quarterly*			
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium							
Magnesium							
Sodium							
Potassium							
Carbon dioxide							
Salinity							
NUTRIENTS							
Nitrate	**			quarterly*	quarterly		
Nitrite	**						
Nitrate + Nitrite							
Ammonia	**					quarterly	
Organic nitrogen	**						
Total nitrogen					quarterly	quarterly	
Phosphate	**						
BACTERIA/VIRUS							
Coliform Group				daily			
Coliform total	**	**	**				
Coliform fecal							
K1 streptococcus							
Enterococcus	**	**	**				
C jejuni		monthly*	monthly*				
Enterococcus E Coli		monthly*	monthly*				
Shigella		monthly*	monthly*				
Salmonella		monthly*	monthly*				
Vibro parahaemolyticus		monthly*	monthly*				
METALS							
Barium				quarterly*			
Beryllium							
Lead				quarterly*	quarterly	quarterly	
Cadmium				quarterly*	quarterly	quarterly	
Cobalt							
Chromium (VI)							
Total Chromium				quarterly*	quarterly	quarterly	
Copper					quarterly	quarterly	
Nickel					semiannually	quarterly	
Zinc					quarterly	quarterly	
Arsenic				quarterly*			
Mercury				quarterly*			
Selenium				quarterly*			
Silver				quarterly*			
Aluminum							
Manganese							
Iron				quarterly*			
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBAs							
Oil and grease							
Organic chemicals (see note 1)							
Total petroleum hydrocarbons				quarterly			
Total organic carbon							
Volatile organic chemicals (see note 2)							
semi-volatile organic chemicals (see note 2)							
PESTICIDES							
Chlorinated pesticides							
PCBs						quarterly	
VISUAL OBSERVATIONS							
Flow estimate							
Water odor							
color							
turbidity							
Storm runoff							
Floating solids							
Sludge, oil, foam							
Tide and wind							
Aquatic plants							
Unusual occurrence							
Algae growth							
Mosquitos, gnats, black flies							
ID fish							
Sediment Char							
Photo algae							
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay							
Radiactivity				quarterly*			
EPA priority pollutants (note 3)				semi-annually			semi-annually
Large scale fish seine or trawl							
Benthic infaunal							
Other							
Total solids						quarterly	
Volatile solids						quarterly	
Volatile suspended solids							
Cation exchange capacity							
Total sulfides	**						
Sed grain	**						
Footnote	** see note 5	*Mar - Sept	*Mar - Sept	*24 hour composite			
Footnote2		** see note 5	** see note 5	** limited			

Waterbody Location Station ID Agency CI number Type of sample	Sludge farm composite soil LVMWD CI 6430 soil	Discharge 001 construction gw LVMWD CI 7128 gw to surface	Malibu Lagoon 8 stations B,C,D,E,G,F,S1,S2 RCD	Malibu Ck 1 station near Cold Ck RWQC-TSM	Malibu Ck 1 station near Cold Ck RWQC-TSM	Malibu Ck Cross Ck Rd Dry weather DPW	Malibu Ck Cross Ck Rd wet weather DPW
CONVENTIONAL							
Total flow		monthly	weekly				
Water level		quarterly	weekly				
Temperature		quarterly	weekly				
pH	annual	quarterly	weekly			monthly	tri-annually
Turbidity		quarterly					
Color quantitative		quarterly					tri-annually
Total suspended solids		quarterly				monthly	tri-annually
Total dissolved solids							
Settleable solids		quarterly					
Dissolved oxygen			weekly				
Chloride		quarterly				monthly	tri-annually
Sulfate		quarterly				monthly	tri-annually
COD		quarterly					
BOD		quarterly				alternate months	tri-annually
Residual chlorine		quarterly					
Boron		quarterly				monthly	tri-annually
Fluoride						monthly	tri-annually
Alkalinity						monthly	tri-annually
Hardness						monthly	tri-annually
Total carbonate							
Specific conductivity						monthly	tri-annually
Calcium						monthly	tri-annually
Magnesium						monthly	tri-annually
Sodium						monthly	tri-annually
Potassium						monthly	tri-annually
Carbon dioxide							
Salinity			weekly				
NUTRIENTS							
Nitrate						monthly	tri-annually
Nitrite						monthly	tri-annually
Nitrate + Nitrite							
Ammonia						monthly	tri-annually
Organic nitrogen							
Total nitrogen	annually						
Phosphate						monthly	tri-annually
BACTERIA/VIRUS							
Coliform Group							
Coliform total		quarterly				monthly	tri-annually
Coliform fecal		quarterly				monthly	tri-annually
K1 streptococcus						monthly	tri-annually
Enterococcus						monthly	tri-annually
E. coli							
Enterococcus E. Coli							
Shigella							
Salmonella							
Vibrio parahaemolyticus							
METALS							
Barium						monthly	tri-annually
Beryllium							
Lead	annually			annually	annually	monthly	tri-annually
Cadmium	annually			annually	annually	monthly	tri-annually
Cobalt							
Chromium (VI)						monthly	tri-annually
Total Chromium	annually			annually	annually	monthly	tri-annually
Copper	annually			annually	annually	monthly	tri-annually
Nickel	annually			annually	annually	monthly	tri-annually
Zinc	annually			annually	annually	monthly	tri-annually
Arsenic				annually	annually	monthly	tri-annually
Mercury				annually	annually	monthly	tri-annually
Selenium				annually	annually	monthly	tri-annually
Silver				annually	annually	monthly	tri-annually
Aluminum						monthly	tri-annually
Manganese						monthly	tri-annually
Iron						monthly	tri-annually
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBAs							
Oil and grease		quarterly				monthly	tri-annually
Organic chemicals (see note 1)				annually	annually		
Total petroleum hydrocarbons						monthly	tri-annually
Total organic carbon						alternate months	tri-annually
Volatile organic chemicals (see note 2)							
Polycyclic aromatic hydrocarbons							
PESTICIDES							
Chlorinated pesticides							
PCBs	annually					monthly	tri-annually
VISUAL OBSERVATIONS							
Flow estimate							
Water odor							
Color							
Turbidity							
Storm runoff							
Floating solids							
Sludge, oil, foam							
Tide and wind							
Aquatic plants							
Unusual occurrence							
Algae growth							
Mosquitos, gnats, black flies							
ID fish							
Sediment Char							
Photo algae							
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay							
Radiactivity							
EPA priority pollutants (note 3)		annually					
Large scale fish seine or trawl							
Benthic infaunal							
Other			Lagoon open or closed				
Total solids							
Volatile solids							
Volatile suspended solids							tri-annually
Cation exchange capacity	annually						
Total sulfides							
Sed grain							
Footnote							
Footnote2							

Waterbody Location	Malibu Ck Cross Ck Rd	Malibu Ck Salvation Army Camp	Madea Ck Kanan Rd	Triunfo Cyn Ck Kanan Rd	Tapia discharge at plant (A-type inspections) RWQCB-C	Malibu Lagoon 3 Stations A, C, PCH RWQCB-MW	Santa Monica Bay shoreline S-1 LA-EMD C11492 surface water
Station ID	RWQCB-P	RWQCB-P	RWQCB-P	RWQCB-P			
Agency							
CI number							
Type of sample	surface water	surface water	surface water	surface water	effluent	sediment	
CONVENTIONAL							
Total flow							
Water level							daily
Temperature							
pH	annually	annually	annually	annually	annually		
Turbidity							
Color quantitative							
Total suspended solids	annually	annually	annually	annually	annually		
Total dissolved solids	annually	annually	annually	annually	annually		
Settleable solids					annually		
Dissolved oxygen							
Chloride	annually	annually	annually	annually			
Sulfate	annually	annually	annually	annually			
COD							
BOD					annually		
Residual chlorine							
Boron	annually	annually	annually	annually	annually		
Fluoride					annually		
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium							
Magnesium							
Sodium							
Potassium							
Carbon dioxide							
Salinity							
NUTRIENTS							
Nitrate	annually*	annually	annually	annually	annually		
Nitrite	annually*	annually	annually	annually	annually		
Nitrate + Nitrite							
Ammonia	annually					annually	
Organic nitrogen						annually	
Total nitrogen							
Phosphate	annually*	annually	annually	annually	annually		
BACTERIA/VIRUS							
Coliform Group							
Coliform total					annually		daily
Coliform fecal							weekly
K1 streptococcus							
Enterococcus							daily
C jejuni							
Enterococcus E Coli							
Shigella							
Salmonella							
Vibrio parahaemolyticus							
METALS							
Barium							
Beryllium							
Lead					annually	annually	
Cadmium					annually	annually	
Cobalt					annually		
Chromium (VI)							
Total Chromium					annually	annually	
Copper					annually	annually	
Nickel					annually		
Zinc					annually	annually	
Arsenic					annually		
Mercury					annually	annually	
Selenium					annually		
Silver					annually	annually	
Aluminium						annually	
Manganese						annually	
Iron							
Cyanide					annually		
ORGANIC CHEMICALS							
Certain chemicals					annually		
MBAs	annually	annually		annually			
Oil and grease					annually		
Organic chemicals (see note 1)						annually	
Total petroleum hydrocarbons							
Total organic carbon							
Volatile organic chemicals (see note 2)					annually		
pesticides							
PESTICIDES							
Chlorinated pesticides					annually		
PCBs							
VISUAL OBSERVATIONS							
Flow estimate	annually	annually	annually	annually			
Water odor							daily
color	annually	annually	annually	annually			daily
turbidity							daily
Storm runoff							
Floating solids							daily
Sludge, oil, foam							
Tide and wind							daily
Aquatic plants							
Unusual occurrence							
Algae growth							
Mosquitos, gnats, black flies							
ID fish							
Sediment Char							
Photo algae							
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay							
Radiactivity							
EPA priority pollutants (note 3)							
Large scale fish seine or trawl							
Benthic infaunal							
Other							
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides							
Sed grain							
Footnote	sampled twice in '92						
Footnote2							

Waterbody Location	Santa Monica Bay nearshore	Santa Monica Bay offshore - 45m	Santa Monica Bay offshore - 60m	Santa Monica Bay offshore - 60m	Santa Monica Bay offshore - 150m	Santa Monica Bay offshore - 45m	Santa Monica Bay offshore - 60m
Station ID	N-1	B-1	C-1	C-1	E-1	B-1	C-1
Agency	LA-EMD	LA-EMD	LA-EMD	LA-EMD	LA-EMD	LA-EMD	LA-EMD
CI number	CI 1492	CI 1492	CI 1492	CI 1492	CI 1492	CI 1492	CI 1492
Type of sample	surface water	surface water	surface water	fish tissue	surface water	sediment	sediment
CONVENTIONAL							
Total flow							
Water level							
Temperature	weekly	weekly	weekly		weekly		
pH		weekly	weekly		weekly		
Turbidity							
Color quantitative							
Total suspended solids							
Total dissolved solids							
Settleable solids							
Dissolved oxygen	weekly	weekly	weekly		weekly		
Chloride							
Sulfate							
COD							
BOD							
Residual chlorine							
Boron							
Fluoride							
Alkalinity							
Hardness							
Bicarbonate							
Specific conductivity							
Calcium							
Magnesium							
Sodium							
Potassium							
Carbon dioxide							
Salinity	monthly	weekly	weekly		weekly		
NUTRIENTS							
Nitrate							
Nitrite							
Nitrate + Nitrite							
Ammonia		monthly	monthly		monthly		
Organic nitrogen							
Total nitrogen							
Phosphate							
BACTERIA/VIRUS							
Coliform Group							
Coliform total	weekly						
Coliform fecal	weekly						
KJ streptococcus							
Enterococcus	weekly						
C jejuni							
Enterococcus E Coli							
Shigella							
Salmonella							
Vibro parahemo							
METALS							
Barium							
Beryllium							
Lead							
Cadmium							
Cobalt							
Chromium (VI)							
Total Chromium							
Copper							
Nickel							
Zinc							
Arsenic							
Mercury							
Selenium							
Silver							
Aluminium							
Manganese							
Iron							
Cyanide							
ORGANIC CHEMICALS							
Certain chemicals							
MBAS							
Oil and grease	monthly	monthly	monthly		monthly	annually	annually
Organic chemicals (see note 1)							
Total petroleum hydrocarbons							
Total organic carbon		monthly	monthly		monthly	annually	annually
Volatile organic chemicals (see note 2)							
Total volatile organic chemicals							
PESTICIDES							
Chlorinated pesticides							
PCBs							
VISUAL OBSERVATIONS							
Flow estimate							
Water odor	weekly	weekly	weekly		weekly		
color	weekly	weekly	weekly		weekly		
turbidity	weekly	weekly	weekly		weekly		
Storm runoff							
Floating solids	weekly	weekly	weekly		weekly	weekly	weekly
Sludge, oil, loam							
Tide and wind	weekly	weekly	weekly		weekly	weekly	weekly
Aquatic plants							
Unusual occurrence							
Algae growth							
Mosquitos, gnats, black flies							
ID fish							
Sediment Char							
Photo algae							
MISCELLANEOUS							
Transparency	weekly	monthly	monthly		monthly		
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay							
Radioactivity							
EPA priority pollutants (note 3)				semiannually		annually*	annually*
Large scale fish seine or trawl			quarterly				
Benthic infaunal						semiannually	semiannually
Other							
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides						annually	annually
Sed grain						annually	annually
Footnote	see note 7	see note 7				*only those in baseline	*only those in baseline
Footnote2							

Waterbody Location	Santa Monica Bay offshore - 150m	Calabasas Landfill 67 stations	Calabasas Landfill 2 stations	Beach Stations 4 stations	Malibu Creek Salvation Army camp	Malibu Creek Cross Creek Road	Cold Creek At Malibu Creek
Station ID	E-1	MW-, CA-, R-, E-sewa strip effluent		004,005,006,007			
Agency	LA-EMD	CSDLAC	CSDLAC	LACDHS	LACDHS	LACDHS	LACDHS
CI number	CI 1492	CI 4992	CI 4992				
Type of sample	sediment	groundwater	groundwater	surface water	surface water	surface water	surface water
CONVENTIONAL							
Total flow							
Water level		quarterly					
Temperature		quarterly					
pH		quarterly	quarterly				
Turbidity							
Color quantitative							
Total suspended solids		quarterly	quarterly				
Total dissolved solids							
Settleable solids							
Dissolved oxygen		quarterly	quarterly				
Chloride		quarterly	quarterly				
Sulfate		quarterly	quarterly				
COD		quarterly	quarterly				
BOD		quarterly	quarterly				
Residual chlorine							
Boron		quarterly	quarterly				
Fluoride		quarterly	quarterly				
Alkalinity		quarterly	quarterly				
Hardness		quarterly	quarterly				
Bicarbonate							
Specific conductivity		quarterly	quarterly				
Calcium		quarterly	quarterly				
Magnesium		quarterly	quarterly				
Sodium		quarterly	quarterly				
Potassium		quarterly	quarterly				
Carbon dioxide		quarterly	quarterly				
Salinity							
NUTRIENTS							
Nitrate		quarterly	quarterly				
Nitrite							
Nitrate + Nitrite							
Ammonia		quarterly	quarterly				
Organic nitrogen							
Total nitrogen							
Phosphate		quarterly	quarterly				
BACTERIA/VIRUS							
Coliform Group							
Coliform total				weekly	weekly	weekly	weekly
Coliform fecal				weekly	weekly	weekly	weekly
K1 streptococcus							
Enterococcus				weekly	weekly	weekly	weekly
C jejuni							
Enterococcus E Coli							
Shigella							
Salmonella							
Vibro parahaemolyticus							
METALS							
Barium		quarterly	quarterly				
Beryllium		quarterly	quarterly				
Lead		quarterly	quarterly				
Cadmium		quarterly	quarterly				
Cobalt		quarterly	quarterly				
Chromium (VI)		quarterly	quarterly				
Total Chromium		quarterly	quarterly				
Copper		quarterly	quarterly				
Nickel		quarterly	quarterly				
Zinc		quarterly	quarterly				
Arsenic		quarterly	quarterly				
Mercury		quarterly	quarterly				
Selenium		quarterly	quarterly				
Silver		quarterly	quarterly				
Aluminium							
Manganese		quarterly	quarterly				
Iron		quarterly	quarterly				
Cyanide		quarterly	quarterly				
ORGANIC CHEMICALS							
Certain chemicals		see Note 4					
MBAs							
Oil and grease	annually	quarterly	quarterly				
Organic chemicals (see note 1)							
Total petroleum hydrocarbons							
Total organic carbon	annually	quarterly	quarterly				
Volatile organic chemicals (see note 2)		quarterly*	quarterly*				
Non-halogenated aromatic hydrocarbons							
PESTICIDES							
Chlorinated pesticides		quarterly	quarterly				
PCBs							
VISUAL OBSERVATIONS							
Flow estimate							
Water odor							
color							
turbidity							
Storm runoff							
Floating solids	weekly						
Sludge, oil, foam							
Tide and wind	weekly						
Aquatic plants							
Unusual occurrence							
Algae growth							
Mosquitoes, gnats, black flies							
ID fish							
Sediment Char							
Phytoplankton							
MISCELLANEOUS							
Transparency							
Transmissivity							
Toxicity - fathead minnow							
Chronic toxicity							
Sensitive species							
3 species							
96 hour in-situ fish bioassay							
Radiactivity							
EPA priority pollutants (note 3)	annually*						
Large scale fish seine or trawl							
Benthic infaunal	semiannually						
Other							
Total solids							
Volatile solids							
Volatile suspended solids							
Cation exchange capacity							
Total sulfides	annually						
Sed grain	annually						
Footnote	*only those in baseline	*see note xx	*see note xx				
Footnote2							

Agencies

RWQCB–P

Regional Water Quality Control Board, Planning Division

RWQCB–MW

Regional Water Quality Control Board, Musselwatch Program

RWQCB–TSM

Regional Water Quality Control Board, Toxics Substance Monitoring

RWQCB–C

Regional Water Quality Control Board, Compliance Monitoring

DPW

Los Angeles County Department of Public Works

RCD

Topanga–Las Virgenes Resource Conservation District

LVMWD

Las Virgenes Municipal Water District

LACDHS

Los Angeles County Department of Health Services

CSDLAC

County Sanitation Districts of Los Angeles County, Calabasas Landfill

LA–EMD

Los Angeles City, Environmental Monitoring Division–Hyperion –Hyperion

Notes

Note 1: Mussel Watch and Toxic Substances Monitoring programs Organic Chemicals

Aldrin, alpha-Chlordane, cis-Chlordane, gamma-Chlordane, trans-Chlordane, cis-Nonachlor, trans-Nonachlor, Oxychlordane, Total Chlordane, Chlorpyrifos, Dacthal, o,p' DDD, p,p'DDD, o,p'DDE, p,p'DDE, o,p'DDT, p,p'DDT, p,p'DDMS, p,p'DDMU, total DDT, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, total Endosulfan, Endrin, alpha-HCH, beta-HCH, delta-HCH, gamma-HCH (Lindane), Heptachlor Epoxide, Hexachlorobenzene, Methoxychlor, Oxadiazon, and Toxaphene

Only in Mussel Watch program. Di-Chloro Benzophenone, Endosulfan, Ethion, and Heptachlor

Only in Toxic Substances Monitoring program Dicolof, Diazinon, Ethyl Parathion, Methyl Parathion, PCB 1248, PCB 1254, PCB 1260, and Chemical Group A.

Note 2: Volatile organic chemicals and others

Regional Water Quality Control Board Tapia Compliance Monitoring.

VOLATILE ORGANIC CHEMICALS and BASE/NEUTRALS AND ACIDS, ACID EXTRACTABLES, ADDITIONAL EXTRACTABLES
Acrolein, Acrylonitrile, Benzene, Bromobenzene, Bromochloromethane, Bromoform, Bromomethane (Methyl bromide), n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon tetrachloride, Chlorobenzene (Monochlorobenzene), Chloroethane, 2-Chloroethylvinyl ether, Chloroform, Chloromethane (Methyl Chloride), o-Chlorotoluene (2-Chlorotoluene), p-Chlorotoluene (4-Chlorotoluene), Dibromochloromethane, Dibromomethane, 1,2-Dichlorobenzene (o-DCB), 1,3-Dichlorobenzene (m-DCB), 1,4-Dichlorobenzene (p-DCB), Dichlorodifluoromethane (Freon 12), 1,1-Dichloroethane (1,1-DCA), 1,2-Dichloroethane (1,2-DCA), 1,1-Dichloroethylene (1,1-DCA), cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropylene, cis- & trans-1,3-Dichloropropylene, Ethyl benzene, Ethylene dibromide (EDB), Hexachlorobutadiene, Isopropylbenzene (Cumene 77356), p-Isopropyltoluene (p-Cymene), Methylene chloride (Dichloromethane), Methyl Ethyl Ketone, Methyl Isobutyl Ketone, Naphthalene, n-Propylbenzene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethylene (PCE), Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,2-Trichloroethane (1,1,1-TCA), 1,1,2-Trichloroethane (1,1,2-TCA), Trichloroethylene (TCE), 1,2,3-Trichloropropane, Trichlorofluoromethane (Freon 11), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,1,2-Trichloro-trifluoroethane (Freon 113), Vinyl chloride (VC), m,p-xylenes, o-Xylene, Acenaphthene, Acenaphthylene, Anthracene, Aldrin, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Benzo(ghi)perylene, Benzyl butyl phthalate, -BHC, BHC, Bis(2-chloroethyl)ether, Bis(2-chloroethoxy)methane, Bis(2-ethylhexyl)phthalate, Bis(2-chloroisopropyl)ether, 4-Bromophenyl phenyl ether, Chlordane, 2-Chloronaphthalene, 4-Chlorophenyl phenyl ether, Chrysene, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dibenzo(a,h)anthracene, Di-n-butylphthalate, 1,3-Dichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 3,3'-Dichlorobenzidine, Dieldrin, Diethyl phthalate, Dimethyl phthalate, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-n-octylphthalate, Endosulfan sulfate, Endrin aldehyde, Fluoranthene, Fluorene, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isophorone, Naphthalene, Naphthalene, Nitrobenzene, N-Nitrosodi-n-propylam, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, Phenanthrene, Pyrene, Toxaphene, 1,2,4-Trichlorobenzene, 4-Chloro-3-methylphenol, 2-Chlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2-Methyl-4,6-dinitrophenol, 2-Nitrophenol, 4-Nitrophenol, Pentachlorophenol, Phenol, 2,4,6-Trichlorophenol, Benzidine, -BHC, -BHC (Lindane), Endosulfan I, Endosulfan II, Endrin, Hexachlorocyclopentadiene, N-Nitrosodiphenylamine

Department of Public Works.

VOLATILE ORGANIC CHEMICALS and BASE/NEUTRALS AND ACIDS, ACID EXTRACTABLES, ADDITIONAL EXTRACTABLES
Benzene, Carbon tetrachloride, 1,4-Dichlorobenzene (p-DCB), 1,1-Dichloroethylene, 1,2-Dichloroethylene, 1,1,1-TCE, Trichloroethylene (TCE), Vinyl chloride (VC), 4,4'-DDE, Dieldrin, Endosulfan sulfate, Heptachlor, Heptachlor epoxide, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260, PCB-1254, Toxaphene, Endosulfan I, Endosulfan II, Endrin,

Calabasas Landfill. Volatile organic chemicals and acid-base neutral extractables. methylene chloride, chloroform, 1,1,1-trichloroethane, carbon tetrachloride, 1,1-dichloroethane, trichloroethylene, bromodichloromethane, tetrachloroethylene, dibromochloromethane, bromoform, chlorobenzene, vinyl chloride, o-dichlorobenzene, m-dichlorobenzene, p-dichlorobenzene, 1,1-dichloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, benzene, toluene, ethyl benzene, trans-1,2-dichloroethylene, bromomethane, chloroethane, 2-chloroethylvinylether, chloromethane, 1,2-dichloropropane, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,1,2,2-tetrachloroethane, acrolein, acrylonitrile, acetone, cis-1,2-dichloroethylene, 2-butanone, acenaphthene, acenaphthylene, anthracene, benzidine, benzo (a) anthracene, benzo (a) pyrene, benzo (b) fluoranthene, benzo (g h i) perylene, benzo (k) fluoranthene, bis (2-cl-ethoxy) methane, bis (2-chloroethyl) ether, bis (2-cl-isopropyl) ether, diethylhexyl phthalate, 4-bromophenyl phenylether, butylbenzyl phthalate, 2-chloranaphthalene, 4-chlorophenylphenylether, chrysene, diebenzo (a,h) anthracene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 3,3'-dichlorobenzidine, diethyl phthalate, dimethyl phthalate, di-n-butyl phthalate, 2,4-dinitrotoluene, 2,6-dinitrotoluene, di-n-octyl phthalate, fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, indeno (1,2,3-c,d) pyrene, isophorone, naphthalene, nitrobenzene, n-nitrosodimethylamine, n-nitrosodi-n-propylamine, phenanthrene, pyrene, 2,3,7,8-TCDD, 2-chlorophenol, 1,2,4-trichlorobenzene, 2,4-dimethylphenol, 2,4-dichlorophenol, 2,4-dinitrophenol, 2-methyl-4,6-dinitrophenol, 2-nitrophenol, 4-nitrophenol, 4-chloro-3-methylphenol, pentachlorophenol, phenol, 2,4,6-trichlorophenol, n-nitrosodiphenylamine.

Note 3: EPA priority pollutants

Note 4: Calabasas Landfill, Other Chemicals Percent methane in gas, percent oxygen in gas, field hydrogen sulfide, phenols, total sulfide, total organic halogen, acetic acid, propionic acid, isobutyric acid, butyric acid, isovaleric acid, valeric acid, antimony, and thallium

Note 5: Enhanced monitoring R-11, S-6, S-7, B-1, B-2 The constituents marked are to be sampled 2 times in the summer and time in the winter, both before and after the lagoon is breached

Note 6: Tapia enhanced monitoring effluent Tox, chloramines, and general monitoring for human enteric viruses are to be sampled monthly, in December, January and February, gene probe for rota viruses, in March, April, June and July, gene probe for Norwalk virus and hepatitis "A "

Note 7: Sea-surface microlayer samples Replicate surface samples are taken of the microlayer (defined as upper 0.05 to 0.1 mm) at stations N-2 and C-2 (and other stations) Samples are taken at least annually and once during periods of 1) minimum stratification, 2) upwelling, and 3) maximum stratification Samples are analyzed for oil and grease and total organic carbon

<u>Metals</u>	<u>Base/Neutral Extractibles</u>	<u>Acid Extractibles</u>
Antimony	Acenaphthene	2,4-Trichlorophenol
Arsenic	Benzidine	P-Chloro-M-Cresol
Beryllium	1,2,4-Trichlorobenzene	2-Chlorophenol
Cadmium	Hexachlorobenzene	2,4-Dichlorophenol
Chromium	Hexachloroethane	2,4-Dimethylphenol
Copper	Bis (2-Chloroethyl) Ether	2-Nitrophenol
Lead	2-Chloronaphthalene	4-Nitrophenol
Mercury	1,2-Dichlorobenzene	2,4-Dinitrophenol
Nickel	1,3-Dichlorobenzene	4,6-Dinitro-O-Cresol
Selenium	1,4-Dichlorobenzene	Pentachlorophenol
Silver	3,3'-Dichlorobenzidine	Phenol
Thallium	2,4-Dinitrotoluene	
Zinc	2,6-Dinitrotoluene	<u>Volatile Organics</u>
	1,2-Diphenylhydrazine	Acrolein
<u>Miscellaneous</u>	Fluoranthene	Acrylonitrile
Cyanide	4-Chlorophenyl Phenyl Ether	Benzene
Asbestos (only if specifically required)	4-Bromophenyl Phenyl Ether	Carbon Tetrachloride
	Bis (2-Chloroisopropyl) Ether	Chlorobenzene
	Bis (2-Chloroethoxy) Methane	1,2-Dichloroethane
<u>Pesticides</u>	Hexachlorobutadiene	1,1,1-Trichloroethane
Aldrin	Hexachlorocyclopentadiene	1,1-Dichloroethane
Chlordane	Isophorone	1,1,2-Trichloroethane
Dieldrin	Naphthalene	1,1,2,2-Tetrachloroethane
4,4'-DDT'	Nitrobenzene	Chloroethane
4,4'-DDE	N-Nitrosodimethylamine	Chloroform
4,4'-DDD	N-Nitrosodi-N-Propylamine	1,1-Dichloroethylene
Alpha Endosulfan	M-Nitrosodiphenylamine	1,2-TransDichloroethylen
Beta Endosulfan	Bis (2-Ethylhexyl) Phthalate	1,2-Dichloropropane
Endosulfan Sulfate	Butyl Benzyl Phthalate	1,2-Dichloropropylene
Endrin	Di-N-Butyl Phthalate	Ethylbenzene
Endrin Aldehyde	Di-N-Octyl Phthalate	Methylene Chloride
Heptachlor	Diethyl Phthalate	Methyl Chloride
Heptachlor Expoxide	Dimethyl Phthalate	Methyl Bromide
Alpha BHC	Benzo (A) Anthracene	Bromoform
Beta BHC	Benzo (A) Pyrene	Bromodichloromethane
Gamma BHC	Benzo (B) Fluoranthene	Dibromochloromethane
Delta BHC	Benzo (K) Fluoranthene	Tetrachloroethylene
Toxaphene	Chrysene	Toluene
PCB 1016	Acenaphthylene	Trichloroethylene
PCB 1221	Anthracene	Vinyl Chloride
PCB 1232	1,12-Benzoperylene	2-Chloroethyl Vinyl Ethe
PCB 1242	Fluorene	
PCB 1248	Phenanthrene	
PCB 1254	1,2,5,6-Dibenzanthracene	
PCB 1260	Indeno (1,2,3-CD) Pyrene	
	Pyrene	
	TCDD	

APPENDIX IV: Addresses of stations (where obtained)

Los Angeles County Department of Health Services

Tapia stations:

118801 Dorothy Drive (camp where road crosses)
Pioma Road and Cold Ck stream 33
3800 Cross Ck Road

Shoreline stations

DHS 004: 22956 Pacific Coast Highway
DHS 005: Malibu Lagoon, east side
DHS 006: Malibu Lagoon, west side
DHS 007: 25000 Malibu Road

Los Angeles City Bureau of Sanitation, Hyperion Laboratory

S-1 Extension of Big Rock Road at
19543 Pacific Coast Highway lat: 34-02-20, long 118-34-55.

off east Coral Beach:

N-1 (9 m) lat. 34-01-27, long. 118-42-54
B-1 (45 m) lat. 34-00-29 long. 118-42-50
C-1 (60 m) lat. 33-59-49 long. 118-42-50
E-1 (150 m) lat. 33-59-03 long. 118-42-50

off east Flores Canyon:

N-1 (9 m) lat. 34-01-50, long. 118-38-33
B-1 (45 m) lat. 34-00-42 long. 118-38-47
C-1 (60 m) lat. 33-59-55 long. 118-38-58
E-1 (150 m) lat. 33-58-39 long. 118-39-16

Las Virgenes Municipal Water District:

Discharge 001: Malibu Creek "Enhancement" Point;
lat. 34-08-55
long. 118-42-28

Discharge 002 Reservoir No 2 outfall,
lat. 34-08-40
long. 118-41-50

Discharge 003: Malibu Gauging Station;
lat. 34-40-40
long. 118-42-03

R-1 Malibu Creek upstream from discharge point 001 at the Salvation Army Camp Bridge (Dorothy Drive)
R-2 Malibu Creek at Malibu Canyon Road (Country Highway N1)
R-3 Malibu Creek at a point below Rindge Dam in the SW quarter of Section 29, T1S/R17W, SBB and M
R-4 Malibu Creek at Cross Creek Road
R-6 Las Virgenes Creek 100' upstream of discharge point 002.
R-7 Las Virgenes Creek 200' downstream from R-6
R-8 Las Virgenes Creek 500' downstream from R-7
R-9 Malibu Creek at a point 100' upstream of confluence of Malibu and Las Virgenes Creeks
R-11 At the center of Malibu Lagoon, near the west shore
R-12 Malibu Creek at a point 100 feet upstream of discharge point 003
R-13 Malibu Creek at a point 100 feet downstream of discharge point 003.

SMBRP, Review of Monitoring/Response Protocol, Malibu Creek Watershed, 1994

- S-1 Malibu Lagoon at the mouth of the sand berm where it is usually breached
- S-6 Malibu lagoon, at the mouth of "c" channel near Malibu Colony and the outlet to the ocean
- S-7 Malibu Lagoon, 900' north of the Pacific Coast highway bridge
- B-1 Shoreline station, 50 yards east of the Lagoon breach site (C-1) at ankle depth
- B-2 Shoreline station 50 yards west of Lagoon breach site (C-1) at ankle depth

Los Angeles County Department of Public Works

Rain Gauges			
1025	Malibu Beach-Dunne	34-02-18	118-38-56
447c	Carbon Cyn	34-02-18	118-38-56
435	Monte Nido	34-04-41	118-41-35
434	Agoura	34-08-08	118-45-08
443B	Latigo Cyn-Beach Ranch	34-05-35	118-48-52
1193	Westlake Village	34-08-19	118-49-05

County Sanitation Districts of Los County

Rain Gauges			
1264	Calabasas Landfill	34-08-25	118-42-35

Ventura County Flood Control District

377F	Lake Sherwood Estates	34-08-26	118-52-31
1170B	Thousand Oaks Weather Station	34-10-44	118-51-01

Appendix V: Comments to Draft (April 1993) Malibu Paper

Comment letters available upon request)

1. RWQCB staff comments- primarily covering grammatical errors and clarifications Anne Saffell, Shirley Birosik, Carlos Urrunaga, Deborah Smith, Manju Venkatanarayana, Wendy Phillips, Gerhardt Hubner, Blythe Ponek-Bacharowski

2 Alan M Bentley, Hydraulic/Water Conservation Division, Department of Public Works, County of Los Angeles.

Comment 1 Add phrase to clarify use of their data for operational and reporting purposes.

Response: Added phrase to text.

3 Dave Yamahara, Assistant Deputy Director, Waste Management Division, Department of Public Works, County of Los Angeles.

Comment 1 Correct phrase about weekend and holiday sampling Mr Yamahara comments that the staff does sample on weekends and holidays

Response: Modify section on holiday sampling to include both original sentence (which is information I received at the interview) with new information in comment

Comment 2 Update section about data requests More data requests had been received in 1993.

Response. Update incorporated into text.

Comment 3 Correction of section about 85 co-permittees

Response Correction incorporated

Comment 4 Correction of section about Malibu sampling station. An automated fixed-site station will be located in Malibu Creek.

Response Correction incorporated

4. Philip Lee, Area Engineer, Division of Safety of Dams, California Department of Water Resources

Comment 1 Correction of Division name

Response: Correction incorporated

Comment 2. Modification of dam inspection/monitoring section

Response Modification incorporated into text.

5 Jack Petrelia, Director of Environmental Protection, Department of Health Services, County of Los Angeles.

Comment 1 Correction of term for mailing list to Beach Closure Notification List (Draft page 3) and state that the public is notified through the media

Response Change name of list but the recommendation otherwise remains the same: to add the environmental groups to the Closure notification list

Comment 2 Public opinion Section (Draft page 14) Comment about public health hazards in the Lagoon

Response Because this is the public opinion section, no change is made to text The comment however, is incorporated later in the Department of Health Services section.

Comment 3. Public opinion section Comment about inspection of horse properties (Draft page 14), in public opinion section.

Response Because this is the public opinion section, no change is made to text. The comment however, is incorporated later in the Department of Health Services section. At a recent Malibu Creek watershed Natural Resources Plan Executive Committee meeting, the Soil Conservation Service estimated that there are 10,000 horses in the Malibu Creek watershed.

Comment 4 Public opinion section: "The need for additional monitoring stations has not been demonstrated. The ability to detect virus in ocean waters is not a viable tool."

Response Because this is the public opinion section, no change is made to text. The comment however, is incorporated later in the Department of Health Services section.

Comment 5 Monitoring/Response Protocol (Draft page 30). Correction and clarification of monitoring protocol and follow up investigation

Response Correction and clarification incorporated into text in Department of Health Services section.

Comment 6. Beach Health (Draft page 73) Clarification of monthly tabulation report, and role of the City of Los Angeles

Response Clarification incorporated into text in Department of Health Services section and in Public Access recommendation section

6. Mahammad A. Fatemi, Stormwater Manager, City of Thousand Oaks.

Comment 1 Findings (Draft page 2 and 77) Clarification that the City of Thousand Oaks is cooperating with all agencies and cities involved in the NPDES permit. "The city of Thousand Oaks is very much involved in all planning and other concerns of the watershed and we use Westlake and UC Riverside's monitoring information." (Draft pages 2 and 77).

Response: A footnote will be added to the NPDES discussion section that the cities, are beginning to coordinate and cooperate more with the NPDES permits requirements and that all of the cities except Westlake Village have participated fully in the Malibu Creek Natural Resources Plan Group. The finding is modified to state that cities should be *even more* involved in overall strategy planning. However, the upper watershed cities are only minimally involved with monitoring and that part of the finding is not changed.

Comment 2 Request that lack of data in upper watershed be elaborated (Draft page 15).

Response This statement is the opinion of the members of the public, and, therefore, the text will not be changed. Subsequent tables and maps in the report demonstrate that there are few upper watershed data.

Comment 3 Requests that UC Riverside be listed as an agency that regularly monitors in the Malibu Creek watershed given that they have monitored Westlake Lake

Response UC Riverside was monitoring Westlake Lake and other lakes in the watershed and in the county as part of a contract with the Regional Board as part of the Basin Plan update process. This was a time-limited monitoring program and is described in the Special Projects section. UC Riverside will not be listed as a regularly monitoring agency.

Comment 4 Request that the report reflect that no additional monitoring is necessary in the upper watershed given that there is already monitoring conducted by Triunfo Sanitation District, Westlake Management, and UC Riverside (Draft page 49).

Response. UC Riverside is no longer monitoring in the watershed (see #3 above). Westlake Management does not conduct extensive monitoring (see program discussion in report) and Triunfo Sanitation District does not conduct monitoring in the upper watershed (see discussion of monitoring locations in report under Las Virgenes Municipal Water District) Therefore, the text in the report will not be changed

7 Mel Makus and Richard Sokulsky, Los Angeles County Agricultural Commissioner, Weights and Measures

Comment 1. Suggest several minor text changes for clarity.

Response Text changes largely incorporated.

8. Sean Manion, Topanga-Las Virgenes Resource Conservation District

Comment 1. Minor changes to citations and to text for clarity.

Response Changes incorporated

9 Jim Edmonson, CalTrout

Comment 1. Suggest text changes for clarity of stream flow and steelhead run.

Response Changes largely incorporated

10 Ane Deister, Las Virgenes Municipal Water District-telephone comment

Comment 1 Remove reference to NPDES permit in enhanced monitoring section

Response. Removed reference.

11 Scott Johnson, City of Los Angeles, Hyperion Treatment Plant.

Comment 1 Correct sampling parameters at specific locations (e g , microlayer at C2 rather than C1 and is 3 times a year)

Response Corrections made

Comment 2 Need clarification for "specially designated biology staff."

Response Text clarified.

Comment 3 Data are not compiled on Paradox database.

Response Database reference is eliminated.

Comment 4 They also perform ambient water toxicity and virus sampling

Response This additional monitoring is added to the text

12. John Mitchell, private consultant.

Comment 1 The draft is poorly organized and opinions vaguely referenced.

Response Sections will be reorganized (alphabetized) and references to others opinions will be tightened.

- Comment 2 In abstract, it is not clear who the public is and why only a few agencies are listed.
Response The abstract will describe the public and the selected agencies in a bit more detail.
- Comment 3 First finding (Draft page 2) "Changing short-term programs provides questionable values for seasonal information."
Response This finding is meant to applaud the flexibility of most of the monitoring programs in that new parameters can be added and new technologies incorporated. Most of the monitoring programs maintain the same locations and general sampling regime from season to season.
- Comment 4 Second finding. Who is determining the success of a program?
Response Good point, the word "successful" will be eliminated
- Comment 5 Fifth finding. Not recognizing that "various agencies have very different types of exposure and responsibility."
Response: The different mandates of the different agencies is explicitly acknowledged in several sections of the report. This finding merely addresses the lack of top level evaluation of monitoring programs (within one's own agency and cross jurisdictional).
- Comment 6. Sixth finding: Data should be *made available* for exchange.
Response. This will be incorporated
- Comment 7 Seventh finding. "Some duplication provides verification of data/laboratory, etc."
Response This is addressed within the body of the report
- Comment 8 Eight finding. "The Regional Board has historically stated and appeared to regulate the watershed's water quality impacts and therefore performed management "
Response The Regional Board has not previously looked at or coordinated all of the data that are/were collected in the watershed
- Comment 9 Eleventh finding (Draft page 3): "What is meant by a consistent weather policy?"
Response. This will be clarified in the text.
- Comment 10. Twelfth finding "Who is the 'public'?"
Response In this finding, the public is meant to be any member of the public, with no restrictions, who is interested in looking at monitoring data.
- Comment 11 Thirteenth finding: "Regional Board is the only agency with the overall responsibility "
Response Several agencies have legally designated responsibility for different problems (e.g., California Department of Fish and Game, National Park Service, etc.)
- Comment 12. Fourteenth finding Change to *representative* environmental groups
Response. This is difficult to do because who is going to decide which is a representative environmental group?
- Comment 13 Fifteenth finding: Should read "with the assistance of permitting agencies educate themselves "
Response Change incorporated.

- Comment 14 Sixteenth finding Who are other individuals? Need examples. Should read "perceived health problems " Why only the lower watershed? Should include reporting and documentation, sampling handling, etc to validate observations.
- Response: This finding will be expanded to address these comments.
- Comment 15 Description of Malibu Creek Watershed (Draft page 7) Need to include the flow of permitted dischargers
- Response. Text will be modified to included permitted dischargers as well as nonpoint source flow
- Comment 16 Uses of Monitoring Data (Draft page 12) Feels that this section does not reflect the real world
- Response. These monitoring parameters describe the ideal overall purpose of monitoring. Descriptions of what the monitoring data is or is not used for in the real world of the Malibu Creek watershed is described in the body of the report.
- Comment 17 Several comments regarding possibly misinformed public opinion (Draft pages 12-14) Suggest that these be changed
- Response. Comment noted The report clearly states that these sections describe public opinion.
- Comment 18 Table 1 (Draft page 17) Should include locations and frequency of monitoring
- Response Details about the monitoring locations and frequency is included in several text and tables elsewhere
- Comment 19 Regional Water Board (Draft page 35) Should include frequency and duration of monitoring
- Response These items are listed on the next few pages and in the appendix
- Comment 20. LA County Department of Beaches and Harbors (Draft page 43) Standard Motor Oil should be changed to Chevron Refinery.
- Response Text will be changed
- Comment 21. Malibou Lake Mountain Club (Draft page 45) "This reference to using blue-stone to a lake appears to violate the Regional Board's enforcement criteria for many years when this was not allowed in LA County "
- Response. In this descriptive section of the report, no discussion of legality is included
- Comment 22 RWQCB Beneficial Use Study "Who is the contractor?" Last sentence is no different than what the Regional Board requires for compliance monitoring.
- Response Cal State Fullerton is the contractor, this will be added. The parameters included in the Beneficial Use study are similar to those required for self monitoring in order to determine impairment
- Comment 23. Second SMBRP study (Draft page 51). Should acknowledge that most locations for continuous monitoring stations are dry in the summer.
- Response. This notation will be included.
- Comment 24. USGS and NPS studies (Draft page 52). These two studies seem similar
- Response: These two agencies will be put into the same heading

- Comment 25 RWQCB Malibu Lagoon Study (Draft page 53) ""How are the findings being utilized?"
- Response The findings will be included in a Total Maximum Daily Load (TMDL) model that the RWQCB will be performing
- Comment 26 DWR (Draft page 54): Should include more detail
- Response. DWR does not currently monitor in the watershed The data are mentioned for historical purposes only
- Comment 27 Trihey studies (Draft page 55): Why do the two studies have the same name? Should mention monitoring frequency
- Response The titles are corrected The frequency is mentioned.
- Comment 28 SMBRP Pathogen Study (Draft page 56) What were the 3 sites that were sampled for viruses?
- Response. In order to keep this document concise, a large amount of detail is omitted. Readers are encouraged to use this section of the report as an annotated bibliography
- Comment 29 Flowers study and Waste Discharge permits (Draft page 56) Where is Flowers figure? More detail should be included
- Response Flowers figure is on draft page 10 See comment #28 for explanation of lack of details
- Comment 30 STORET Draft page 57): "Any information from those who use the system and their feelings?"
- Response Text is modified to mention that the staff who contribute to and use the system find it cumbersome
- Comment 31 Opinions of the agencies (Draft page 58) Comments regarding opinions.
- Response These items are paraphrases of quotations and are not changed
- Comment 32 Agencies overall efforts (Draft page 59). "The existence of Regional Board programs is unknown as well as frequency and parameters Data not openly shared "
- Response This important issue is addressed in several sections later in the report
- Comment 33 Duplication (Draft page 60). This item has been approved as a protocol in the SMBRP
- Response A footnote to that effect is added
- Comment 34 Rain gauges (Draft page 61): "Data is continuously shared by La County and Ventura which includes real time information in their flood control responsibilities "
- Response. Comment noted This section concerns the other agencies that do not know about all of the rain gauges.
- Comment 35 Need for comprehensive goals (Draft page 62) Second recommendation needs "to clearly recognize that dry weather flows are greatly impacted by NPDES permitted discharges "
- Response This concern will be incorporated.
- Comment 36. Comparison of monitoring (Draft page 63): a) "First paragraph demonstrates that the author is not fully informed about activities in other areas b) [In recommendation] much of this is required monitoring "

- Response a) The percentage of sampling in Malibu versus other areas of the region was obtained in this study through interviews with staff at all of the major resource and other agencies.
- b) Only a portion of the Malibu Creek is required to be monitored by the RWQCB. However, at the time of the study, many agencies were monitoring the watershed on their own (e.g , LA County DPW prior to the continuous monitoring station)
- Comment 37. Overlaps in monitoring efforts (Draft page 63) "The concerns references typical situations for all programs and Permit Requirements "
- Response Comment noted
- Comment 38 Overlaps in Monitoring Efforts (Draft page 64): "Will the Regional Board as regulator accept these recommendations? Many proposals will create lab concerns "
- Response: The Regional Board has some flexibility in its own compliance monitoring and in its monitoring requirements of dischargers and will be able to respond to some of the recommendations. Lab concerns will have to be factored in
- Comment 39 Need to expand monitoring (Draft page 65): [Calabasas] sentence indicates a controlled source under Board permit needs regulatory actions. Includes many speculative statements which are questionable "
- Response: A letter dated May 1993, is included as a footnote that details the Regional Board's follow up to SWAT investigation
- Comment 40 Gaps in Data recommendations (Draft page 66) a) "24 lagoon " should be "24 hour lagoon " b) Coordinated sampling idea good but "may very well reduce the frequency of observations etc, by limiting site visits
- Response: a) Correction made b) Two intensive surveys of the watershed (which carry out this recommendation) were performed in 1993 These sampling events did not supersede other monitoring efforts
- Comment 41 What is being done with data (Draft page 66) "Currently Regional Board staff are very limited ."
- Response. Good point, this is why data need to be used in a more efficient way.
- Comment 42. Top Down Decisions (Draft page 67) "Many constituents (and monitoring frequency) continue due to potential of or may be etc "
- Response Even so, constituents need to be revisited from time to time.
- Comment 43 Municipal NPDES permit (Draft page 67) All cities in the watershed are required to be a part of the Permit. Thousand Oaks has not participated and Regional Board staff have not followed through with regulations "
- Response In 1993-94, much progress has been made in compliance with the permit. This is noted in a footnote
- Comment 44. Regional Board Compliance Monitoring Budget (Draft page 68): "How many NPDES permits in watershed?"
- Response: The number of NPDES permits is discussed in detail in previous sections
- Comment 45. Need for weather policy (Draft page 68). "Many do not know how to track storms across the watershed "
- Response: This recommendation has to do with timing of samples and record keeping.

- Comment 46 Outside expertise/permit writing (Draft page 68) "What about impacted agencies? Not now involved."
Response Modification is made to text
- Comment 47 Make permits consistent (Draft page 69). "General permits do not recognize site specific information and are usually not inspected."
Response This recommendation does not advocate general permits, but rather, consistency in the customized permits
- Comment 48 Regional Board permits recommendations (Draft page 70) "If major problems exist in each river, they should not be permitted to continue."
Response Comment noted
- Comment 49 Annual Reports (Draft page 71) "How will those unaware of the data be better aware of the reports. What is needed is a compilation of monitoring activities, a central clearinghouse "
Response. We need both. See the following paragraph
- Comment 50 Response protocol (Draft page 72) "Spill reporting to impacted agencies is seldom done in timely manner."
Response. Comment noted
- Comment 51 Long term response (Draft page 72) "what are examples of Regional Board programs?"
Response These are added
- Comment 52. Excessive nutrients in lagoon (Draft page 74): what is the meaning of excess?
Response. Causing eutrophication or other problems
- Comment 53 Sediment (Draft page 74) history shows that lakes are really wet detention basins and normal eutrophication is interrupted by man's dredging "
Response Comment noted
- Comment 54 Source of high coliform (Draft page 75) Should include time prior to and since breaching.
Response Technical details of sapling are dependent on the type of monitoring.
- Comment 55 Formalize visual observation (Draft page 76) Should include "familiar with the visual quality " "
Response. Text is modified

13 Shiaw Huitric, County Sanitation Districts of Los Angeles County

- Comment 1. General information in letter about the Calabasas landfill
Response This additional information will be incorporated
- Comment 2 Table 1 (Draft page 17): Number of stations for Calabasas landfill is approximately 70 groundwater wells and three runoff monitoring locations
Response Changes will be made.
- Comment 3. Calabasas section (Draft page 43). Clarification about the history of the landfill Disagree with geological characterization

Response. Historical changes will be made. RWQCB staff states that the geological description is accurate. More information about the bedrock geology is added.

Comment 4. Clarification about number and type of monitoring wells

Response Text and tables are modified

Comment 5. Clarification about type of permit/requirements

Response Correction is made

Comment 6. Clarification about SWAT program and verification monitoring

Response Correction will be made. A RWQCB letter dated May 13, 1993 (SWAT Report Findings) will be quoted instead

Comment 7. Disagree with including EIR VOCs information.

Response: Text will be modified to clarify that the VOCs have not been tied directly to the landfill

14. Jeff Harris, M D , Environment Now, via telephone

Comment 1 Minor text changes for clarification

Response. Changes largely made

Comment 2 LA County West Mosquito Abatement District (Draft page 35) There are complaints about black flies around Serra Retreat

Response This is added.

Comment 3 Source of high coliform (draft page 75) Need more than dye studies, need isotope tracers or bacteria (killed polio virus) as tracers for leaking septic systems.

Response: This is incorporated

15 Peter Warshall, Consultant

Comment 1 Draft does not distinguish between mass emission and concentration monitoring

Response: A sentence will be added to the introduction (Types of monitoring) clarifying that all monitoring, at this point, is based on concentrations. Flow volumes in the creek are measured by the LA County Department of Public Works. Las Virgenes Municipal Water District maintains discharge flow records

Comment 2 Draft does not describe source detection-type monitoring. Draft should identify which monitoring programs address which sources.

Response An extensive discussion of source monitoring is beyond the scope of this report. The Regional Board, however, is commencing a total daily maximum load assessment of the watershed which will look at the sources and may recommend a monitoring strategy to address these.

Comment 3. The draft is not clear about the relationship of coliform counts and human health

Response The section related to coliform and viruses in the lagoon is shortened. These issues are policy issues and are beyond the scope of this report.

- Comment 4 Add a recommendation that the agencies should "Decide the purpose of the monitoring and what threshold will cause what policy or agency action before hand "
- Response: This recommendation is added to the findings
- Comment 5 Commenter feels that draft does not adequately address the time that it takes for pollutants to move downstream. The commenter implies that it is possible for Tapia's discharge to take several months to reach the lagoon, given some residence time behind Rindge Dam. The commenter feels that baseflow in the watershed needs to be tracked.
- Response. The purpose of this report is primarily to provide information about the current status of monitoring within the watershed and how that monitoring could be coordinated within existing resources. The Soil Conservation Service, as mentioned in the report, is performing a baseline study of the hydrology of the watershed. More detailed hydrological studies will require additional funding. There is no "residence" time behind Rindge Dam because the reservoir is entirely silted up. The short term effect of discharge from Tapia is seen within a few hours (or less!) downstream at Cross Creek Road.
- Comment 6 "Why spend money on agency monitoring if agency actions are covered by telephone complaints?"
- Response: This report is focussed on improving agency action beyond crises response to telephone complaints.
- Comment 7 The draft should "clearly state that is not reviewing the statistical protocols of monitoring or . . .the design of sampling . . . From comments within the draft, sampling appears all too casual to withstand scientific review." The draft does not discuss the best suite of indicators of human health in saline waters. Recommendation: A watershed-wide peer review committee for all sampling procedures."
- Response: This report shows that the sampling in the watershed is not done in the most careful scientific manner. It is beyond the scope of the report to go into detail about the best monitoring protocol. The recommendation of a watershed-wide review committee is added to the report.
- Comment 8 Commenter recommends that there be agreement on thresholds for action.
- Response: See comment # 4 above.
- Comment 9 Disagrees with arch tone about his report. Disagrees with the use of the term "leaky septic systems."
- Response Text about report is softened. "Leaky" septic systems is reworded.
- Comment 10 The commenter provides additional "opinions of the city" that raise concerns that are not covered by the draft including: new receiving water standards, monitoring osmotic shock, baseline for invertebrate fauna, and monitoring first flush storms.
- Response These additional points are added to the text where appropriate.

