

Malibu Creek Watershed Monitoring Program: Task 12 Report

City of Calabasas

March 2008

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Funding for this project has been provided in full or in part through an Agreement with the State Water Resource Control Board (SWRCB) pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments thereto for the implementation of California's Nonpoint Source Pollution Control Program. The contents of this document do not necessarily reflect the views and policies of the SWRCB, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.



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March 24, 2008

Mr. Alex Farassati
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Subject: Malibu Creek Watershed Monitoring Program – SWRCB Agreement No. 03-128-554-2
Draft Task 12 Project Report

Dear Mr. Farassati:

In accordance with our professional services agreement for the subject project, Camp Dresser & McKee Inc. (CDM) has prepared the enclosed draft report to fulfill the requirements of Subtasks 12.1 and 12.2 of the subject SWRCB Agreement.

We welcome review of the enclosed report. Comments may be addressed to the undersigned. CDM appreciates the cooperation of and input from the staff of the various agencies involved in the Monitoring Program.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Donald J. Schroeder'.

Donald J. Schroeder, P.E.
Vice President
Camp Dresser & McKee Inc.

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Section 1

Introduction to Monitoring Program

This Project Report presents a summary of all activities performed in fulfillment of the Malibu Creek Watershed Monitoring Program, partially funded by the California State Water Resource Control Board under Agreement Number 03-128-554-0. The report fulfills the requirements of *Task 12 Draft and Final Report* of the Agreement. The information is contained in the following sections:

- Section 1 – Introduction to Monitoring Program – includes a statement of purpose, and briefly summarizes the scope of the project, and a description of the approach and techniques used during the project
- Section 2 – Task Deliverables – includes a list of task deliverable previously submitted
- Section 3 – Additional Information – addresses additional information that is deemed appropriate
- Section 4 – Project Evaluation – indicates whether the purposes of the project have been met

1.1 Purpose

The cities of Calabasas, Agoura Hills, Westlake Village, and Malibu, along with the County of Los Angeles (collectively called the Watershed Management Committee (WMC) and the Las Virgenes Municipal Water District (LVMWD) developed the MCWMP to update the 1999 Draft Malibu Creek Watershed Monitoring Program. The MCWMP was selected for funding under Proposition 13 by the State Water Resources Control Board (SWRCB) to provide more comprehensive data, eliminate redundancies, and provide more comprehensive water quality information in the Malibu Creek watershed. The MCWMP is intended to provide information for the use of policy makers, regulatory agencies, and the public. Water quality in this watershed is integral to consideration of current and future public policies. The primary goal of the MCWMP was to collect data and information on pollutants and other problems that impair beneficial uses of Malibu Creek and its tributary streams. The monitored sites were chosen to represent a variety of land uses so that data collected would lead to a comprehensive understanding of how pollutants are affecting the basic watershed health and beneficial uses throughout the watershed.

The Malibu Creek Watershed Monitoring Report (Report) uses the full set of data collected under the MCWMP, as well as data compiled from several other monitoring activities within the watershed, to summarize water quality conditions for major waterbodies in the watershed during different weather conditions and seasons as discussed below. This information was then used in the selection of appropriate pollution prevention measures and BMPs within watersheds that can be used to improve water quality in waterbodies of concern.

1.2 Scope of Project

1.2.1 Malibu Creek Watershed Background

The Malibu Creek Watershed is a major watershed in Western Los Angeles County and southeastern Ventura County. At 109 square miles, it is the second largest watershed draining to the Santa Monica Bay. The MCW includes portions of unincorporated Los Angeles and Ventura Counties, as well as seven Cities in the two Counties. Much of the watershed is open space under the jurisdiction of the State of California State Parks, National Park Service, Conejo Parks and Recreation, Simi Recreation District, Mountain Recreation and Conservation Authority, and the Santa Monica Mountains Conservancy.

Creeks and lakes located in the upper portions of the watershed drain into Malibu Creek which then continues through the downstream portion of the watershed draining into Malibu Lagoon and ultimately into Santa Monica Bay when the Lagoon is breached. 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 and dry weather urban runoff sources. During this period, Malibu Lagoon is disconnected from the ocean by a sand bar. During the first rain storms of the wet season, runoff from the watershed increases flow in Malibu Creek dramatically, resulting in the Lagoon breaching the sand bar and runoff flowing out to the Bay. The natural hydrology of the watershed has been modified by the creation of several dams and man-made lakes, the importation of water to the system for human use to support region for urban growth and subsequent dry-weather urban runoff from developed areas and the presence of the Tapia Water Reclamation Facility (WRF) which provides significant dry weather flow to the system in the winter months (November 16 to April 14). In the summer months, secondary treated effluent from Tapia WRF is sprayed on fields surrounding the WRF to avoid direct discharge to Malibu Creek.

The land use distribution in the Malibu Creek watershed is about 80% undeveloped and 20% developed. The developed land is a mixture of high density residential (13%), commercial/industrial (4%) and agricultural (3%) land uses. A significant portion (approximately 40%) of the residential development is low density.

The western part of the watershed drains the areas around Hidden Valley, Potrero Creek, Westlake and Triunfo Creek (a total area about 25,210 acres). These areas are largely undeveloped. There is limited agricultural land use, located mostly in the Hidden Valley subwatershed. Most of the residential and commercial/industrial land use is in the area around Westlake Village. Nearly all the runoff from this large watershed area is funneled to Triunfo Creek and ultimately to Malibou Lake. There is limited historical data for many waterbodies in this part of the watershed; however recent projects including this MCWMP have begun to collect data.

The eastern side of the Malibou Lake drainage area is 15,900 acres and includes the subwatersheds associated with Lindero, Medea, Palo Camodo, and Cheseboro

Creeks. The land use in these subwatersheds, while still predominantly undeveloped, has a relatively higher percentage of residential and commercial land uses compared to other subwatersheds, especially in the Medea Creek and Lindero Creek subwatersheds, where developed land uses make up 34 and 43 percent, respectively.

Outflow from Malibou Lake is discharged to Malibu Creek, which also receives flow from Las Virgenes Creek and Stokes Creek. Land use at the bottom of the watershed near the Lagoon includes some residential and commercial area, from which much of the runoff is now routed to a new stormwater BMP project at the City of Malibu Civic Center. Many developments in the Malibu Lagoon subwatershed and in unincorporated areas in the less densely developed areas primarily in the middle to lower portions of the MCW are not connected to a public sewer and rely upon on-site wastewater treatment systems (OWTS).

1.2.2 Description of Approach and Techniques

1.2.2.1 Malibu Creek Watershed Monitoring Program

Water quality monitoring during dry and wet weather at 13 sites within the Malibu Creek watershed was conducted twice per month between February 2005 and February 2006. Water quality parameters were chosen based on general categories of 303(d) listed pollutants, including bacteria indicators, sediment, nutrients, nutrient related impairments, and on-site recorded water quality indicators in order to establish baseline data. All chemical and bacterial samples were mid-stream grabs using lab sampling bottles provided by the project's contracted laboratory, CRG Laboratories Inc. Before all sampling events, pH and conductivity meters were calibrated at the project's laboratory located at the Las Virgenes Municipal Water District's Rancho Composting Facility. All water samples collected were retrieved by a CRG Laboratory driver at the Juan Bautista de Anza Park in Calabasas and taken to the CRG Laboratory in Torrance for analysis. The samples delivered met the six hour maximum holding time for bacteria during all sampling events. The program's Quality Assurance Project Plan (QAPP) was followed during all sampling events and water sample analysis. The results of this first year of data are summarized in Section 2.1 of the Task 10 report and presented in detail in the 2006 Annual Baseline Report (Rinehart and Medlen, 2006).

After analyzing first year baseline data, "Hot Spots" were identified for further testing in order to identify the sources of biological and ecological degradation in the watershed. These "Hot Spots" were determined by the reoccurrence of high levels of pollutants, especially bacteria and nutrients. Additional parameters were also considered in selecting hot spots, including upstream land use and area, fish tissue analysis, acute and chronic toxicity and bioassessment data (MCWMP, 2007).

The fish tissue analysis and bioassessment monitoring was conducted concurrent with the baseline water quality monitoring, but as a subset of the 13 sampling locations. Results of these analyses are summarized in Sections 2.2 and 2.3. The full methodology and results of the fish tissue and bioassessment studies were

documented in two reports (Aquatic Bioassay & Consulting Laboratory, 2006; Aquatic Bioassay & Consulting Laboratory, 2007).

Per the recommendations of 2006 Annual Baseline Report and the Technical Advisory Committee, four sites (LIN2, LV2, MED2 and TRI) were tested twice during winter wet weather and seven sites (LC, LIN2, LV2, MED1, TRI-ALT, HtB-4 and RUS) were tested once during winter dry weather, for the following EPA Priority Pollutants: trace metals, asbestos, cyanide, total hardness, acid extractable compounds, base/neutral extractable compounds, chlorinated pesticides, Polychlorinated biphenyls (PCB) congeners and polynuclear aromatic hydrocarbons (PAHs). The results of this additional water quality monitoring are summarized in Section 2.1 and presented in detail in the 2007 Report on "Hot Spot" Monitoring (Rinehart, 2007).

1.2.2.2 Other Monitoring Activities

In addition to the MCWMP, other water quality monitoring in the MCW continues to be conducted by several agencies and by volunteers through non-profit organizations. Water quality data from several of these sources have been integrated with the results of the MCWMP monitoring to identify specific areas and pollutants of concern. The additional water quality monitoring programs referred to for this purpose are described below. The data from these activities was combined with the data collected under the MCWMP described in Section 1.2.2.1 for the purposes of data comparison and analysis.

- **County of Los Angeles Mass Emission Station:** Mass emission monitoring has been conducted by the County of Los Angeles as part of its National Pollutant Discharge Elimination System (NPDES) monitoring requirements since 1994. One mass emission monitoring location is within the Malibu Creek Watershed Management Area (WMA) and is located on Malibu Creek downstream of the confluence with Cold Creek.
- **Malibu Creek Watershed Water Quality Monitoring Project (MCW-WQMP):** During 2004-2005, The County of Los Angeles contracted Weston Solutions Inc. to monitor the wet- and dry-weather water quality from seven of the inland storm drain outfalls in the Malibu Creek Watershed. Three storm events and three dry-weather days were sampled during the wet season and nine dry-weather days were sampled during the dry season.
- **LVMWD's NPDES Permit Monitoring:** During certain months of the year, the Tapia WRF discharges to Malibu Creek above the confluence with the Las Virgenes River. As part of the NPDES requirements, the LVMWD has monitored a full suite of water quality parameters at seven sites along Malibu Creek upstream and downstream of the discharge. LVMWD has sampled for fecal coliform since 1997, following the requirement for tertiary treatment of effluent (NPDES Permit No.CA0053953, Order No. 97-135). This monitoring program has been reduced to include only one site above the WRF and two sites below and is currently being re-evaluated by the Regional Water Quality Control Board (RWQCB) and

LVMWD based on the presence of other watershed wide monitoring programs and review of historical water quality data in Malibu Creek from the LVMWD monitoring stations. Additionally, 18 monthly samples (July 2001 - December 2002) were collected from Malibu Creek (R-1) and analyzed for volatile and semi-volatile pollutants, heavy metals, and pesticides to assess compliance with the California Toxics Rule (CTR).

- **Heal the Bay Stream Team:** Heal the Bay is a non-profit organization that has been active in monitoring water quality in the Santa Monica Bay and its contributing watersheds through a volunteer group called the "Stream Team." The Stream Team has collected monthly samples since 1998 from 17 locations in the Malibu Creek Watershed.
- **Surface water quality monitoring at several locations in Cheseboro Creek** is required as part of the NPDES Permit for Los Angeles County Sanitation District's (LACSD) Calabasas Landfill. Under this permit, two samples are to be collected at each stormwater monitoring location during the wet season months (October to May). Samples are collected only when the storm produces rainfall of sufficient intensity or duration to produce runoff, and only if the runoff event has been preceded by three working days of dry weather. The runoff samples are analyzed for the constituents specified in the NPDES general permit. During the calendar year of 2006, storm water runoff samples were collected from storm events that occurred on February 27 and on March 17.

1.2.2.3 Monitoring Results

Monitoring results for bacteria, nutrients, metals, and EPA priority toxic pollutants was presented in Section 2 of the Task 10 Report. These data were related to specific water quality targets, which differ in the basis for their regulatory targets. For bacteria and nutrients, the adopted TMDL for bacteria and a draft TMDL for nutrients were used as a basis for water quality targets. Metals and other EPA priority toxic pollutants were evaluated against EPA Priority Toxic Pollutant Levels, when applicable, and EPA secondary maximum contaminant levels (MCLs).

Section 3 of the Task 10 report provides results by pollutant, subwatershed, and watershed-wide analyses. Several general watershed-wide observations regarding water quality conditions were developed by evaluating monitoring data from all of the sites within the MCW. These observations are summarized below:

- Bacteria concentrations are generally greatest downstream of urbanized land use areas in most waterbodies.
- Nutrient concentrations are greatest downstream of agricultural areas in the Hidden Valley Creek subwatershed. Organic nitrogen was the predominant form of nitrogen in MCW streams, except for Malibu Creek downstream of Tapia WRF during the winter months, when effluent is discharged to the creek.

- Upstream land use alone was not a strong predictor of water quality concentrations.
- Ammonia concentrations in MCW streams were below acute and chronic toxicity targets in most samples.
- Summer season total phosphorus (TP) frequently exceeded the 0.1 mg/l target at most sites.
- Index of Biotic Integrity (IBI) scores were poor or very poor throughout watershed, except in Lower Malibu Creek, where conditions were categorized as fair. These IBI scores were similar to the results of the LA County NPDES bioassessment surveys. Poor IBI scores were influenced by degradation of stream habitat and anthropogenic inputs.
- Calabasas Landfill may be a significant source of Total Suspended Solids (TSS) in Cheseboro and Liberty Canyon Creeks.
- Most “Hot Spots” monitoring found exceedences for metals not currently on the 303d list, including Al, Fe, Mb, Mn, Mo, and Sr. Mercury and lead generally below water quality targets (except at landfill) although on the 303(d) list for Triunfo Creek.
- Selenium concentrations exceeded California Toxics Rule targets in most subwatersheds. Selenium is positively correlated with nitrate, suggesting that nitrate in groundwater may be mobilizing Se from marine sedimentary bedrock.

1.2.2.4 Pollution Prevention Recommendations

The pollution prevention recommendations detailed in the Task 10 Report are based on knowledge of the MCW, available land for project implementation, and need based on water quality monitoring information. The listing of best management practices (BMPs) included both structural and nonstructural solutions. Structural solutions range from small scale projects implemented throughout the MCW, as appropriate, such as stream buffers or local capture systems, to large scale regional projects such as sub-surface flow wetlands and regional infiltration systems.

Section 2

Task Deliverables

The following provides a summary of all task deliverables required and created as part of the MCWMP. Where applicable, specific documents have been noted and provided as appendices to this report.

Task 1 – Project Administration

Task 1 involves the various project management activities such as budgeting and scheduling, project status reports and submission of deliverables. Deliverables for this task include progress reports, the contract summary form, subcontractor documentation, expenditure/invoice projections, and the project survey form. Documentation associated with this task can be provided upon request.

Task 2 – California Environmental Quality Act (CEQA) Documentation and Permits

No CEQA documentation or permits were required for the Monitoring Program.

Task 3 – Quality Assurance and Project Plan (QAPP)

The QAPP specifies the quality control personnel, procedures, and methodology require for the Monitoring Program. The QAPP, as submitted on November 16, 2004, is located in Appendix A.

Task 4 – Project Assessment and Evaluation Plan (PAEP)

The PAEP coordinates the efforts of the various agencies and activities of the Monitoring Program, and specifies criteria to evaluate its effectiveness. The PAEP located in Appendix B.

Task 5 – Technical Advisory Committee (TAC)

The TAC has been actively, periodically meeting throughout the MCWMP process. A list of the TAC members, their roles and responsibilities, and meeting minutes are located in Appendix C.

Task 6 – Monitoring Program

The Monitoring Program submitted by the Malibu Creek Watershed Advisory Council in March 2005 summarizes the methodology approach, and describes site locations. The Monitoring Report is located in Appendix D.

Task 7 – Monitoring

Training was required for staff implementing the Monitoring Program. Training certification and information can be provided upon request.

Task 8 - “Hot Spot” Testing

Task 8 includes the MCWMP Baseline Report 2005, MCWMP 2006 Annual Baseline Report, MCWMP 2007 Report on “Hot Spot” Monitoring, 2005 MCWMP Bioassessment Monitoring Report, and the MCWMP Fish Bioaccumulation Survey 2005. These reports are located in Appendix E.

Task 9 - Electronic Copy of Database

An electronic copy of the Monitoring Program database is included on a compact disk in Appendix F.

Task 10 - Assessment of Data Collected

The Malibu Creek Watershed Monitoring Report and Program Evaluation Matrix assesses and summarizes the results of the monitoring performed by the Malibu Creek Watershed Advisory Council. These documents are located in Appendix G.

Task 11 - Outreach

Outreach associated with this project was closely tied with the activities of TAC. Specific documentation associated with outreach activities can be made available upon request.

Section 3

Additional Information

No additional information was noted or deemed appropriate by the Project Representative. All information pertaining to this project has been noted above and summarized in Section 2.

Section 4

Project Evaluation

The goal of the MCWMP was to coordinate efforts in the watershed to identify point and non-point sources of pollution and methods by which such pollution can be prevented or reduced. Specific project objectives involved a number of key aspects. The first was to establish the baseline conditions in the watershed to be used as a basis for reference. This was achieved by integrating monitoring data from various existing sources as well as conducting new monitoring activities. Secondly, supplementing the baseline conditions, EPA priority pollutants were to be located and further monitored. Also through establishing the baseline conditions, data gaps were to be identified, indicating the areas where additional data collection and monitoring would be required. From there, a plan could be developed plan for additional monitoring to fill data gaps. Finally, a project objective was to create a Technical Advisory Committee (TAC) team of watershed stakeholders that would plan and coordinate water quality efforts in the watershed. Each of these objectives would work together to make the process and resulting information available for use by policy makers, regulatory agencies and the public. A summary of the objectives and the status of achievement is presented in the Table below and briefly described in the text below.

	Project Objective	Status
1	Further establish and characterize baseline conditions	Achieved – Completed: <i>Malibu Creek Watershed Monitoring Program, 2006 Annual Baseline Report</i>
2	Locate EPA priority pollutants	Achieved – Completed: <i>2007 Report on “Hot Spot” Monitoring: Malibu Creek Watershed Monitoring Program</i>
3	Fill in water quality data gaps	Achieved – Ongoing: Monitoring included in this program has provided useful data, providing information where existing water quality monitoring may have had a gap or lack of consistent data. A comprehensive analysis of the watershed health was achieved by integrating data from various existing sources as well as from the new monitoring work.
4	Create Technical Advisory Committee team with watershed stakeholders	Achieved – Ongoing. The Technical Advisory Committee continues to meet monthly.

Establishment of baseline conditions was achieved through a program of bi-weekly watershed sampling from 2005 to 2007 at thirteen sites along ten streams. The sampling program included water quality parameters based on Clean Water Act

regulatory requirements addressing impaired waters (Section 303(d)). The program also made an effort to include pre-defined data gaps, identified 'hot-spot' areas (sites indicating high levels of pollutants), and included bioassessment and bioaccumulation analyses. Documentation of this work can be found in the Malibu Creek Watershed Monitoring Program, 2006 Annual Baseline Report, included in Appendix E. In addition to the monitoring described in the baseline report, supplemental data came from a fish tissue analysis and biological indicator monitoring (or bioassessment) which further gauged baseline watershed health.

Location of EPA Priority Pollutants was achieved through the 'Hot Spot' Monitoring. After the first year of baseline sampling, pollution 'hot spots' were identified as areas needing further monitoring and indicated by the reoccurrence of high levels of pollutants, especially bacteria and nutrients and/or for which there was little or no information. These areas were then further tested for EPA priority pollutants including: trace metals, asbestos, cyanide, total hardness, acid extractable compounds, base/neutral extractable compounds, chlorinated pesticides, PCB congeners and polynuclear aromatic hydrocarbons. Documentation of this work can be found in the 2007 Report on "Hot Spot" Monitoring: Malibu Creek Watershed Monitoring Program, provided in Appendix E.

The MCWMP included 13 stations within the MCW between February 2005 and February 2006, sampling a range of targeted pollutants. The primary goal of the MCWMP has been to collect data and information on pollutants and other problems that impair beneficial uses of Malibu Creek and its tributary streams. The monitored sites were chosen to represent a variety of land uses in the upstream tributary areas so that data collected would lead to a comprehensive understanding of how pollutants are affecting the basic watershed health and beneficial uses throughout the watershed. This information is being combined with water quality data from other existing and ongoing monitoring programs to continue developing a complete picture of water quality within the area.

The TAC has been meeting regularly on a bi-monthly basis since the inception of this project. Generally speaking, the TAC for this program has been meeting through the MCW Advisory Council's Monitoring and Modeling subcommittee and has included stakeholders and responsible agencies from throughout the MCW. This group has coordinated with other regional efforts, including the MCW TMDL Implementation Plan (TMDLIP) and North Santa Monica Bay Watersheds Regional Watershed Implementation Plan (RWIP) efforts, and will continue to do so, continuing to use this information to improve water quality within the region.

Appendix A

Quality Assurance and Project Plan

Appendix B

Project Assessment and Evaluation Plan

Appendix C

Technical Advisory Committee

Appendix D

Monitoring Report

Appendix E

“Hot Spot” Testing

Appendix F

Monitoring Program Database

Appendix G

Assessment of Data Collected