

**Revised**

# **MALIBU CREEK WATERSHED GROUP NOTICE OF INTENT**

**ENHANCED WATERSHED MANAGEMENT PROGRAM**

**AND**

**COORDINATED INTEGRATED MONITORING PROGRAM**

SUBMITTED BY:

**Malibu Creek Watershed Group**

On Behalf of:

City of Agoura Hills

City of Calabasas

City of Hidden Hills

City of Westlake Village

County of Los Angeles

Los Angeles County Flood Control District

**FIRST SUBMITTAL: JUNE 27, 2013**

**RESUBMITTED ON DECEMBER 12, 2013**

**1. PROGRAM TYPE AND PERMITTEES [MS4 Permit Section VI.C.4.b.i and Attachment E Section IV.C.1]**

The Permittees (listed in Table 1) that are party to this Notice of Intent (NOI) hereby notify the Los Angeles Regional Water Quality Control Board (Regional Water Board) of their intent to develop an Enhanced Watershed Management Program (EWMP) for the Malibu Creek Watershed (MCW). This NOI is being submitted in accordance with Part VI.C.4.b.i of Order R4-2012-0175. Permittees meet the LID and Green Streets conditions and will submit a Work Plan within 18 months of the effective date of the Order R4-2012-0175 (June 28, 2014) and will submit the Draft EWMP within 30 months of the effective date of Order R4-2012-0175 (June 28, 2015).

The Permittees (listed in Table 1) that are party to this NOI hereby notify the Regional Water Board of their intent to develop a Coordinated Integrated Monitoring Program (CIMP). The Permittees intend to follow a CIMP approach for each of the required monitoring programs elements and will submit the CIMP within 18 months of the effective date of Order R4-2012-0175 (June 28, 2014).

**Table 1. Enhanced Watershed Management Program Permittees**

|   |   |
|---|---|
| 1 | City of Agoura Hills                      |
| 2 | City of Calabasas                         |
| 3 | City of Hidden Hills                      |
| 4 | City of Westlake Village                  |
| 5 | County of Los Angeles                     |
| 6 | Los Angeles County Flood Control District |

**2. INTERIM AND FINAL TDML COMPLIANCE DEADLINES [Section VI.C.4.b.ii]**

Table 2 lists the Total Maximum Daily Loads (TMDLs) that have specifically been developed for the Malibu Creek Watershed and the TMDLs that apply to the Malibu Creek Watershed as a subwatershed in the Santa Monica Bay Watershed Management Area. Interim and final compliance deadlines of the Malibu Creek Watershed Trash and Santa Monica Bay Debris TMDLs and final compliance deadlines of other TMDLs occurring prior to the anticipated approval date of the EWMP (April 28, 2016) are included in Table 3.

The watershed control measures that will be implemented to meet the requirements of the interim and final trash water quality based effluent limits (WQBELs) and all other final WQBELs are described in more detail in Attachment 1 of this NOI.

**Table 2. TMDLs applicable to Malibu Creek Watershed**

| No. | Resolution No.     | Watershed        | Pollutant                  | Title  | Status                                     |
|-----|--------------------|------------------|----------------------------|--|--|
| 1   | R12-009            | Malibu Creek     | Bacteria                   | Reconsideration of Certain Technical Matters of the TMDL for Bacteria Indicator Densities in Malibu Creek and Lagoon | Approved by Regional Board on Jun. 7, 2012 |
| 2   | 2008-007           | Malibu Creek     | Trash                      | Malibu Creek Trash TMDL  | TMDL In Effect on Jul. 7, 2009             |
| 3   | 2004-019R          | Malibu Creek     | Bacteria                   | Malibu Creek Bacteria TMDL   | TMDL In Effect on Jan. 24, 2006            |
| 4   | R10-010            | Santa Monica Bay | Debris                     | Bay Nearshore Debris TMDL  | TMDL In Effect on Mar. 20, 2012            |
| 5   | 2002-022           | Santa Monica Bay | Bacteria                   | Bacteria TMDL (Wet Weather)  | TMDL In Effect on Jul. 15, 2003            |
| 6   | U.S. EPA ID: 11900 | Malibu Creek     | Nutrients                  | Malibu Creek Nutrient TMDL   | EPA Promulgated Mar. 21, 2003              |
| 7   | US EPA             | Malibu Creek     | Sedimentation and Nutrient | Sedimentation and Nutrient TMDL  | Expected Establishment: Jul. 2013          |
| 8   | U.S. EPA           | Santa Monica Bay | Toxics                     | Toxics TMDL  | EPA Promulgated Mar. 26, 2012              |
| 9   | 2002-004           | Santa Monica Bay | Bacteria                   | Bacteria TMDL (Dry Weather)  | TMDL In Effect on Jul 15, 2003             |

**Table 3. Interim (trash) and final TMDL compliance deadlines prior to EWMP approval**

| TMDL                                   | Milestone   | Interim /Final | Deadline  |
|--|---|----------------|---|
| Malibu Creek Trash TMDL                | 20% reduction of baseline load  | Interim        | July 7, 2013  |
|  | 40% reduction of baseline load  | Interim        | July 7, 2014  |
|  | 60% reduction of baseline load  | Interim        | July 7, 2015  |
|  | 80% reduction of baseline load  | Interim        | July 7, 2016  |
|  | 100% reduction of baseline load   | Final          | July 7, 2017  |
| Santa Monica Bay Beaches Bacteria TMDL | Compliance with allowable exceedance days for summer and winter dry weather | Final          | Dry Weather: July 15, 2006<br>Winter Dry: July 15, 2009<br>Wet Weather: July 15, 2021 |
| Malibu Creek and Lagoon Bacteria TMDL  | Dry Weather<br>Wet Weather  | Final<br>Final | January 24, 2012<br>July 15, 2021   |
| Santa Monica Bay                       | 20% reduction of trash from Baseline WLA                                    | Interim        | March 20, 2016  |
|  | 40% reduction of trash from Baseline WLA                                    | Interim        | March 20, 2017  |
|  | Achieve the plastic pellet WLA  | Final          | March 20, 2017  |

|                     |  |         |                |
|---------------------|--|---------|----------------|
| Beaches Debris TMDL | 60% reduction of trash from Baseline WLA               | Interim | March 20, 2018 |
|                     | 80% reduction of trash from Baseline WLA               | Interim | March 20, 2019 |
|                     | 100% reduction of trash from Baseline WLA <sup>1</sup> | Final   | March 20, 2020 |

**3. GEOGRAPHICAL SCOPE [Section VI.C.4.b.iii.(1)]**

As shown in Table 4, the Malibu Creek Watershed has land under the jurisdiction of the Counties of Los Angeles and Ventura, numerous cities in the Counties of Los Angeles and Ventura, and several State of California and Federal agencies. The total land area of the watershed is approximately 70,651 acres.

**Table 4. Overview of the Entire Malibu Creek Watershed**

| Watershed Agencies                        | EWMP Participation | Land Area (Acres) | Percentage of Land Area |
|---|--------------------|-------------------|-------------------------|
| Caltrans                                  | No                 | 342               | 0.48%                   |
| City of Agoura Hills                      | Yes                | 5,178             | 7.33%                   |
| City of Calabasas                         | Yes                | 4,941             | 6.99%                   |
| City of Hidden Hills                      | Yes                | 105               | 0.15%                   |
| City of Malibu                            | No                 | 536               | 0.76%                   |
| City of Simi Valley                       | No                 | 123               | 0.17%                   |
| City of Thousand Oaks                     | No                 | 6,292             | 8.91%                   |
| City of Westlake Village                  | Yes                | 3,540             | 5.01%                   |
| County of Los Angeles                     | Yes                | 19,228            | 27.22%                  |
| County of Ventura                         | No                 | 15,360            | 21.74%                  |
| Los Angeles County Flood Control District | Yes                | N/A               | N/A                     |
| National Park Service                     | No                 | 6,881             | 9.74%                   |
| Santa Monica Mountains Conservancy        | No                 | 477               | 0.68%                   |
| State Parks                               | No                 | 7,648             | 10.83%                  |
| <b>Total Land Area (Acres)</b>            |                    | <b>70,651</b>     | <b>100%</b>             |

Table 5 shows the agencies that have agreed to collectively develop the Malibu Creek Watershed EWMP and CIMP. The agencies include the County of Los Angeles, the Los Angeles County Flood Control District, and all the cities within the Malibu Creek Watershed that are located in the County of Los Angeles, except the City of Malibu. The land area that is under the

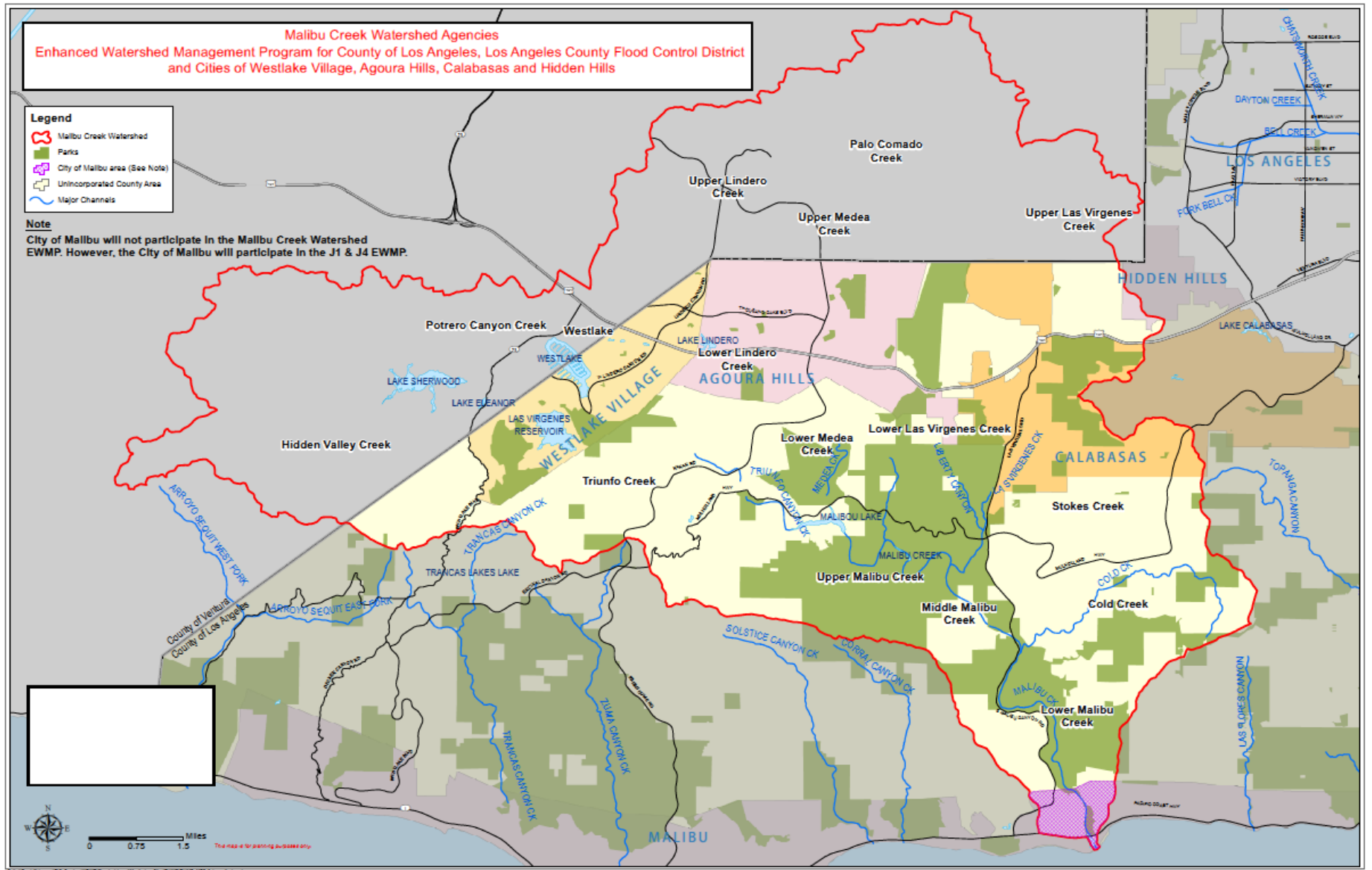
<sup>1</sup> Note: If within three (3) years of Regional Board adoption date of this TMDL, a city or county voluntarily adopts local ordinances to ban plastic bags, smoking in public places and single use expanded polystyrene food packaging, it shall receive a three-year extension of the final compliance date.

jurisdiction of the aforementioned MS4 Permittees comprises the geographic scope of the MCW EWMP, as shown in Figure 1. The MCW EWMP area is approximately 32,992 acres, which is approximately 46.7 percent of the total area in the Malibu Creek Watershed. The agencies that are participating in the development of the MCW EWMP do not have jurisdiction over the lands that are under the jurisdiction of the National Park Service, State Park Service, the Santa Monica Mountains Conservancy, and Caltrans; therefore, those lands are not included in the area that will be addressed by the EWMP. However, the MS4 Permittees that are participating in the development of the MCW EWMP will seek collaboration with these agencies during the development of the MCW EWMP.

**Table 5. MCW EWMP Agencies and Land Area**

| <b>EWMP Participating Agencies</b>        | <b>Land Area (Acres)</b> | <b>Percentage of Land Area</b> |
|---|--------------------------|--------------------------------|
| City of Agoura Hills                      | 5,178                    | 15.70%                         |
| City of Calabasas                         | 4,941                    | 15.00%                         |
| City of Hidden Hills                      | 105                      | 0.30%                          |
| City of Westlake Village                  | 3,540                    | 10.70%                         |
| County of Los Angeles                     | 19,228                   | 58.30%                         |
| Los Angeles County Flood Control District | N/A                      | N/A                            |
| <b>Total Land Area (Acres)</b>            | <b>32,992</b>            | <b>100%</b>                    |

Figure 1. Map of the MCW EWMP Area



#### **4. PLAN CONCEPT [Section VI.C.4.b.iii.(1)]**

The Malibu Creek Watershed EWMP agencies have a long history of working together and have collectively developed several implementation plans with strategies for compliance in a Malibu Creek Watershed Integrated TMDLs approach. The implementation and compliance strategies are based on a multi-pollutant approach with a focus on green infrastructure Best Management Practices (BMPs) that maximize the retention and use of urban runoff as a resource for recharging aquifers and for irrigation and other uses. Many of the green infrastructure projects proposed in the 2007 Integrated TMDL Implementation Plan for the Malibu Creek Watershed (2007 TMDL IP) were identified by the Watershed's stakeholders.

The Malibu Creek Watershed EWMP will build on the 2007 TMDL IP, re-evaluate the proposed watershed control measures, identify additional regional projects to maximize opportunities for retaining all non-stormwater runoff and stormwater from the 85<sup>th</sup> percentile, 24-hour storm event, and identify additional watershed control measures for those areas in the watershed that cannot be addressed by an enhanced regional project.

Based on the available information, the Malibu Creek Watershed EWMP agencies believe that opportunities exist, within the agencies' collective jurisdictional areas, for collaboration on multi-benefit projects that will meet the intent of the EWMP approach. Several regional, multi-benefit projects that had been included in the 2007 TMDL IP shall be considered for the EWMP regional projects.

#### **5. COST ESTIMATE [Section VI.C.4.b.iii.(2)]**

The Malibu Creek Watershed EWMP agencies collaboratively prepared a scope of work and cost estimate for developing the EWMP Work Plan, the CIMP, and the EWMP for the Malibu Creek Watershed. It is estimated that the cost for the EWMP Work Plan, the CIMP, and the EWMP development will be \$600,000. This estimate assumes that the CIMP and EWMP will, in part, be based on the existing Malibu Creek Watershed Bacteria TMDL Coordinated Monitoring Plan, the 2007 TMDL IP, and several other watershed planning documents. In addition to contract costs it is estimated that the cost of staff time for EWMP Agencies to administer, research, evaluate, and prepare for reviews and approvals will exceed several hundred thousand dollars over the 30 month period.

#### **6. MEMORANDUM OF AGREEMENT [Section VI.C.4.b.iii.(3)]**

Attachment 2 includes a final draft of the Memorandum of Agreement between the City of Calabasas, as the lead agency, and the other Malibu Creek Watershed EWMP participating agencies. Also included in Attachment 2 are letters of intent for the participating agencies.

**7. INTERIM MILESTONES AND DUE DATES FOR PLAN DEVELOPMENT [Section VI.C.4.b.iii.(4)]**

Table 5 summarizes the interim milestones and due dates for development of the EWMP Work Plan, CIMP, and EWMP. The milestones are based on the scope of work agreed to by the Malibu Creek Watershed EWMP agencies. The draft technical memoranda will summarize the information and approaches for development of the specified components of the EWMP Work Plan, CIMP, and EWMP. It is expected that the draft technical memoranda will not be finalized, instead the information presented in the memoranda will be revised based on comments and presented in the Work Plan, CIMP, and EWMP.

**Table 5. Proposed interim milestones and deadlines for plan development**

| Milestone  | Due Date      |
|--|---------------|
| <b>EWMP Work Plan</b>  |               |
| Draft Technical Memoranda <ul style="list-style-type: none"> <li>• Identification of water quality priorities</li> <li>• Existing and future watershed control measures, identification of potential regional projects</li> <li>• Reasonable assurance analysis approach</li> <li>• BMP selection approaches</li> </ul>                                      | February 2014 |
| Internal draft of EWMP Work Plan   | April 2014    |
| Work Plan submitted to the Regional Water Board  | June 2014     |
| <b>Coordinated Integrated Monitoring Plan</b>  |               |
| Draft Technical Memoranda <ul style="list-style-type: none"> <li>• Outfall and receiving water monitoring approach</li> <li>• Monitoring sites selection</li> <li>• New development and redevelopment effectiveness tracking</li> </ul>  | March 2014    |
| Internal draft of CIMP   | April 2014    |
| Draft CIMP submitted to the Regional Water Board   | June 2014     |
| <b>Enhanced Watershed Management Program</b>   |               |
| Draft Technical Memoranda <ul style="list-style-type: none"> <li>• Approach to US EPA TMDLs, 303(d) listings, other exceedances of RWLs</li> <li>• Final selection of regional projects</li> <li>• Feasibility analyses of regional projects, customization of MCMs, identification of other BMPs</li> <li>• Project schedules and cost estimates</li> </ul> | March 2015    |
| Internal draft of EWMP   | May 2015      |
| Draft EWMP submitted to the Regional Water Board   | June 2015     |

**8. STRUCTURAL BMP [Section VI.C.4.b.iii.(5)]**

During the 30-month program development, the Malibu Creek Watershed Group will be implementing 2 structural BMPs to demonstrate its commitment to improving water quality in the watershed. The goal of both projects is to reduce dry- and wet-weather runoff for the beneficial use of surface irrigation or infiltration. Below is a brief description of the structural BMPs. Project fact sheets are included in Attachment 3.



- a) Citywide Smart irrigation Control System shall be implemented by the City of Calabasas  
Replacement of irrigation controllers is projected to provide regional benefits by reducing urban runoff that is associated with nutrient loaded recycled water used for irrigation and will reduce discharges of other pollutants to the MS4 system carried by overwatering of landscaped areas. City uses 66,431 gallons of water on annual basis for landscape irrigation. It's anticipated that with the new system city will save between 13,300 to 16,600 gallons of water. It will translate to approximately 5,000 to 7,000 gallon of reduction in run-off.
  
- b) Lindero Parkway Improvements shall be implemented by the City of Westlake Village  
This parkway project is 30 foot wide by over a mile long. Half of this parkway was originally a flood control maintenance road and the other half a landscaped area. This project will have a Riparian Zone theme. With the new project, the combined width of the old maintenance road and landscaped area, this area will become a new walking path where there is currently no sidewalk. This project, when completed, will provide a long and meandering walking path with conversation seating areas. This project will also include drainage facilities that will include specific BMP's. The newly renovated area will be drained via bio-swales throughout the entire length of the project. These swales will meander thru the entire length with the main goal of percolation and evaporation of all nuisance flows throughout the year. Stormwater runoff would then be treated in the bio-swale followed by discharge into Westlake Lake. This project will also have educational signage on a riparian zone and the stormwater cleanup objectives of this project. Additional information is provided in Attachment No. 3

**9. LID ORDINANCE [Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (1)]**

Table 6 summarizes the status of Low Impact Development (LID) ordinances by the MCW EWMP agencies. As presented in Table 6, greater than 50 percent of the MCW EWMP Area has a draft LID ordinance in place. A copy of the draft ordinances is available upon request.

**Table 6. Summary of percent EWMP area addressed by LID ordinances**

| EWMP agency                               | % EWMP area | Status LID ordinance |
|---|-------------|----------------------|
| City of Agoura Hills                      | 15.7%       | Drafted              |
| City of Calabasas                         | 15.0%       | Drafted              |
| City of Hidden Hills                      | 0.3%        | Drafted              |
| City of Westlake Village                  | 10.7%       | Drafted              |
| County of Los Angeles                     | 58.3%       | Drafted              |
| Los Angeles County Flood Control District | N/A         | N/A                  |

**10. GREEN STREET POLICES [Sections VI.C.4.b.iii.(6) and VI.C.4.c.iv. (2)]**

Table 7 summarizes the status of green street policies by the MCW EWMP agencies. As presented in Table 7, greater than 50 percent of the land area in the MCW EWMP Area has a draft green streets policy in place. A copy of the draft policies is available upon request.

**Table 7. Summary of percent EWMP area addressed by Green Street policies**

| <b>EWMP agency</b>                        | <b>% EWMP area</b> | <b>Status green street policies</b> |
|---|--------------------|-------------------------------------|
| City of Agoura Hills                      | 15.7%              | Drafted                             |
| City of Calabasas                         | 15.0%              | Drafted                             |
| City of Hidden Hills                      | 0.3%               | Drafted                             |
| City of Westlake Village                  | 10.7%              | Drafted                             |
| County of Los Angeles                     | 58.3%              | Drafted                             |
| Los Angeles County Flood Control District | N/A                | N/A                                 |

**Attachment 1**  
**Specific Actions by EWMP agencies**  
**for Compliance with Interim and Final Milestones**  
**of the Malibu Creek Watershed TMDLs**

**Malibu Creek Watershed Trash TMDL**

Listed below are current Best Management Practices (BMPs) that have been put in place by the responsible parties:

**City of Agoura Hills**

The City of Agoura Hills has released contractor bid documents for the installation of full trash capture devices. Units will be installed on all catch basins within the area subject to the TMDL within the timelines provided in Table 3. Some of the City's efforts to implement control measures for compliance with the TMDL are provided in the following:

**Existing Ordinances:**

- 1) No. 9392.1. - Outdoor Storage and Display Standards Enumerated - Programmatically address the proper handling and disposal of trash and debris associated with landscape maintenance activities.
- 2) No. 9395.1. - Outdoor Dining Design and Operational Standards Enumerated – This section addresses the proper handling of waste associated with food establishment activities.
- 3) Chapter 12 Social Host Accountability - (f):
  - a) No. 5328 - Litter - Provides litter control from general activities.
  - b) No. 5300 - Regulation of Solid Waste Haulers' Activities
  - c) No. 5335 - Residential Collection - Solid Waste Containers
  - d) No. 5343 - Commercial - Maintenance and Placement of Containers - Solid waste containers provided by the collector shall be maintained in a clean and healthful condition by the collector.
  - e) No. 5505 - Prohibited Activities. (b) Littering -
  - f) No. 9576.1 - Trash Handling - Trash handling facilities shall be provided for all developments within the CD overlay district with the exception of single-family detached dwellings.

**Programs and Projects:**

- 1) Street Sweeping - Street sweeping was increased to twice a month within the City's jurisdictional streets.
- 2) California Highway Adoption Company - The City has contracted more than five years with California Highway Adoption Company to perform trash pick-up and weed abatement along the freeway corridor and local streets as directed by City staff.

- 3) Catch Basin Grates & Filters - The City began a pilot program with Water Way Solutions by installing catch basin grates and filters located in two areas by schools to measure their success.
- 4) Storm Drain Marking - All storm drain inlets are stenciled with a "No Dumping. Drains to Ocean." message.
- 5) County Media Contribution - The City of Agoura Hills contributes annually to the County's
- 6) Don't Trash California campaign.
- 7) Trash Receptacles - The City has installed additional trash receptacles at various parks.
- 8) Covenant & Deed Restriction - Development project subject to SUSMP requirements are conditioned to record a covenant for the maintenance of treatment devices.
- 9) Creek Clean-Up - The City sponsors annual community creek clean-up events in various accessible areas of Lindero Creek.
- 10) City Webpage - The City has improved their webpage by increasing the stormwater information.

### **City of Calabasas**

#### **Existing Ordinances:**

- 1) No. 2008.251 - Mobile car wash ordinance requires mobile car wash businesses to obtain permits from the City and follow certain regulations to prevent pollutants from entering the storm drain system.
- 2) No. 2006.217 - Second hand smoke ordinance to ensure a cleaner and more hygienic environment for the City, its residents and its natural resources including its creeks and streams.
- 3) No. 2007.233 - Polystyrene ban barring retail food establishments, nonprofit food providers and City facilities from using food packaging materials made of expanded polystyrene, known popularly by the trademark name Styrofoam.

#### **Programs and Projects:**

- 1) A total of 156 storm drain catch basin are currently being retrofitted by full capture devices within all public streets in the Malibu Creek Watershed in the City of Calabasas. The project is expected to be completed by September 2013. City is projected to install curb screens on the remaining catch basins as part of a citywide retrofit program by December 2014. Combined with existing CDS units, existing bio-filtration/bio-remediation device and on-going public education campaign, the implementation of this project will bring the City in full compliance with the Trash TMDL.
- 2) Storm Drain Markers - Over 3200 markers were installed on storm drain catch basins throughout the City.

- 3) CDS Unit - Calabasas has managed the installation of one Continuous Deflector Separation (CDS) Units. CDS Unit allows for the separation of sediment and trash from storm water without screens thus allowing for continuous flow before discharging to local creeks. The units are cleaned out on a quarterly basis.
- 4) Infiltration and Bioremediation of Urban Runoff - The City of Calabasas was tasked to design and build a storm water treatment facility to improve the quality of water entering Malibu Lagoon via Las Virgenes Creek and Malibu Creek. This device filters 100% of the average dry weather flow observed in the storm drain and retains all solid pollutant larger than 0.25 inches. A pump unit is integrated with this filter system to bring the filtered water upwards several feet to the sub-surface level to an infiltration bed. Water in the infiltration unit infiltrates to the ground using an area of about 2,400 sq. ft.
- 5) Creek Clean-Ups - The City hosts two annual community creek clean-up events in various accessible areas of Las Virgenes Creek.
- 6) Street Sweeping - Weekly street sweeping takes place within the City's jurisdictional streets.

### **County of Los Angeles**

There are a total of 272 catch basins within County of Los Angeles (County) Unincorporated Areas of the Malibu Creek Watershed. To date, the County has installed full capture trash inserts in 187 of these catch basins to achieve a 69 percent reduction in the baseline waste load allocation. The County expects to install full capture trash screens in the remaining 85 catch basins by December 2014 to achieve a 100 percent reduction in the baseline waste load allocation ahead of the July 7, 2017 compliance deadline established in the TMDL.

### **Existing County Code:**

- 1) Illegal Dumping ban in unincorporated County public lands and/or private land that is not designated for that disposal purpose.
- 2) Stormwater and Runoff Pollution control ordinance which includes a ban on littering. This also includes signage for littering fines and penalties.
- 3) Smoking ban in County Parks prohibited outside of designated smoking areas unless granted by the facilities manager and/or director.
- 4) Ban on plastic grocery bags in unincorporated areas of Los Angeles County

### **Programs and Projects:**

- 1) Storm Drain Markers - All storm drains in unincorporated County are appropriately marked with a "no dumping" message.

- 2) Street Sweeping Program - Street sweeping is conducted weekly in unincorporated areas of Malibu Creek Watershed that have curb and gutter.

### **City of Hidden Hills**

The City of Hidden Hills performed Daily Generation Rate studies for trash and evaluated storm water discharges, to document the amount of trash generated and to demonstrate compliance with the interim trash reduction milestone specified in Table 3. Data for trash collection conducted between August 20, 2012 and September 19, 2012 demonstrates that the City is in compliance with the current effluent limitation for trash. The City's annual trash generation rate is 43 pounds, significantly below the 5703 pounds per year using values derived from the default baseline of the TMDL and Regional Board Staff Report. The City will comply with WLAs by implementing a program for partial capture systems (PCS) in conjunction with best management practices.

#### **Programs and Projects:**

- 1) Street Sweeping - Major thoroughfares, residential streets, and parking lots are swept on a weekly, bi-weekly, and monthly basis respectively.
- 2) Ordinances - The City has adopted and enforces litter ordinances to reduce sources of trash within City jurisdictional areas.
- 3) Trash Receptacles - The City has installed trash and recycling receptacles at various high-use locations throughout the City.
- 4) Valet Waste Bins - Waste bin services are available to reduce the accidental discharge of trash.
- 5) City Clean Up Services - Community Association maintenance and cleaning crews routinely clean the entire City area.
- 6) SUSMP/Code Enforcement - SUSMP and the building code are implemented to ensure that building sites are being kept clean.

### **City of Westlake Village**

There are a total of 43 catch basins within the area of Westlake Village that is subject to Malibu Creek Trash TMDL. Of the 43 catch basins, 27 are schedule to be retrofitted with a full capture device by July 7, 2013. The remaining 16 catch basins are within a gated community, and therefore considered to be privately owned. However, these 16 catch basins are connected to a privately owned stormdrain line that eventually drains through a CDS unit prior to discharging to Lake Lindero.

#### **Programs and Projects:**

- 1) Street Sweeping - The City conducts street sweeping citywide on a weekly basis.

- 2) Daily Trash Collection - City public works staff conduct trash collections in the public right-of-way daily.
- 3) Ordinances - The City has enactment and enforcement of litter ordinances to reduce sources of trash within city jurisdictional areas.
- 4) Trash Receptacles - The City has installed trash receptacles at all bus stops, and public gathering areas.
- 5) Catch Basin Cleaning and Maintenance- All City owned and maintained catch basins are cleaned annually and stenciled with a “No dumping – Drains to Lake” message.
- 6) Trash/Debris Capture Devices - The City has retrofitted 25 non-TMDL area catch basins with mechanical trash excluders and eight non-TMDL area debris basin standpipes with filter fabric. By way of SUSMP conditioning, several trash mitigation structural BMPs have been installed throughout the City; such as CDS and clarifier devices.

### **Malibu Creek and Lagoon Bacteria TMDL**

The County of Los Angeles County and the Los Angeles County Flood Control District have submitted Time Schedule Order (TSO) requests for this compliance milestone to the Regional Water Quality Control Board. Under this TSO the County and Flood Control District will perform a Microbial Identification and Source Tracking Study to identify if bacterial exceedances are caused by anthropogenic or natural sources. If the cause of the bacterial exceedances is determined to be anthropogenic, the anthropogenic sources will be identified through the study. This study is essential to identifying actions necessary for compliance with this TMDL.

Finding no direct link between infrequent exceedances from monitoring sites located within receiving waters and municipal outfalls, the EWMP agencies are looking at the above study to help determine the nature and severity of the loading.

The following list includes some of the actions and initiatives undertaken by the agencies in the Malibu Creek Watershed to comply with the Malibu Creek and Lagoon Bacteria TMDL:

1. Constructed water quality improvement projects such as the Malibu Civic Center Stormwater Treatment Facility and Legacy Park Projects, Las Virgenes Creek Restoration Project, Lindero Creek Ozone Treatment Pilot Project, Malibu Lagoon Restoration Project, Medea Creek Restoration Project, Citywide Bioswale Median Enhancement Project, as well as retrofitting of public facilities with LID BMPs to treat onsite runoff, and the capture and infiltration of runoff from a 50-acre city owned facility;
2. Implemented housekeeping BMPs such as street sweeping (some of which is conducted on all streets agency wide on weekly basis), annual inspections and maintenance of critical facilities that include removal of sediment, rotting vegetation, algae mats, and other debris, which in turn reduces food sources for bacteria and bacterial loading;
3. Developed and implemented a robust public outreach program with a focus on the issues of bacterial loading in the Malibu Creek and its tributaries; anthropogenic sources

of bacteria; environmental conditions that promote bacterial growth; how the transport of bacteria through the watershed may be reduced by proper collection and disposal of feces from pets, horses, livestock, etc.; proper disposal of trash, including organics like food waste; and reduction of dry-weather runoff, etc. Throughout the years, the MS4 Permittees have conducted numerous public outreach efforts in the Malibu Creek Watershed and the surrounding vicinity that address water-quality issues, mostly notably the Living Lightly in our Watersheds Guide;

4. Developed Low-Impact Development and Water Quality Ordinances;
5. Developed Plans and Studies, such as Structural Best Management Practices Planning and Feasibility Study, Study on Effects of Dense Vegetation and Reduced Flow Rate on Bacterial Levels, Lindero Creek and Stormdrain Bacteria Hotspot Study, Bacteria Source Identification Study, Monitoring Study on Effects of UV Exposure of Elevated Bacterial Loading from Underground Stormdrain Lines, and Integrated TMDL Implementation Plan for the Malibu Creek Watershed; and
6. Open Space Preservation, through land acquisitions such as Ladyface Mountain, King Gillette Ranch, and Ahmanson Ranch.



**Attachment 2**  
**Memorandum of Understanding and Letters of Intent**

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN THE CITY OF CALABASAS AND PARTICIPATING AGENCIES  
(CITIES OF AGOURA HILLS, HIDDEN HILLS, AND WESTLAKE VILLAGE, AND  
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT AND COUNTY OF LOS ANGELES)**

**REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE  
MALIBU CREEK WATERSHED ENHANCED WATERSHED MANAGEMENT PROGRAM AND  
COORDINATED INTEGRATED MONITORING PROGRAM**

This Memorandum of Understanding (MOU), made and entered into as of the date of the last signature set forth below by and between the CITY OF CALABASAS, a municipal corporation (CITY), and PARTICIPATING AGENCIES (Cities of Agoura Hills, Hidden Hills, and Westlake Village and Los Angeles County Flood Control District (LACFCD) and County of Los Angeles). Collectively, these entities shall be known herein as "PARTIES" or individually as "PARTY."

WITNESSETH

WHEREAS, the Los Angeles Regional Water Quality Control Board (Regional Board) adopted the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit (MS4 Permit) (Order No. R4-2012-0175); and

WHEREAS, the MS4 Permit became effective on December 28, 2012, and requires that the LACFCD, County of Los Angeles, and 84 of the 88 cities (excluding Avalon, Long Beach, Palmdale, and Lancaster) within the County of Los Angeles comply with the prescribed elements of the MS4 Permit; and

WHEREAS, the PARTIES have agreed to collaborate on the compliance of certain elements of the MS4 Permit and have agreed to a cost sharing formula based on Land Area with a Base Fee, attached hereto as Exhibit A and made part of this MOU; and

WHEREAS, the PARTIES agree that each shall assume full and independent responsibility for ensuring its own compliance with the MS4 Permit despite the collaborative approach of this MOU; and

WHEREAS, the PARTIES collaboratively prepared a final Scope of Work and Request for Proposal to obtain a Consultant to assist the PARTIES with compliance with certain elements of the MS4 Permit; and

WHEREAS, the PARTIES propose for the Consultant to prepare and deliver a Final Work Plan, an Enhanced Watershed Management Program (EWMP), and a Coordinated Integrated Monitoring Program (CIMP) (collectively, PLANS) in compliance with certain elements of the MS4 Permit, at a total cost of approximately six hundred thousand dollars (\$600,000); and

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK WATERSHED EWMP AND CIMP

WHEREAS, the PARTIES have determined that hiring a Consultant to prepare and deliver the PLANS will be beneficial to the PARTIES and they desire to participate and will provide funding in accordance with the cost allocation on Exhibit A; and

WHEREAS, the CITY will act on behalf of the PARTIES in the preparation of the PLANS.

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the PARTIES, and of the promises contained in this MOU, the PARTIES agree as follows:

- (1) Recitals: The recitals set forth above are fully incorporated as part of this MOU.
- (2) Purpose: The purpose of this MOU is to cooperatively fund the preparation and submittal, to the Regional Board, of the PLANS.
- (3) Voluntary: This MOU is voluntarily entered into for the purpose of preparing and submitting to the Regional Board the PLANS.
- (4) Terms: This MOU shall become effective on the latest date of execution by a PARTY and shall remain in effect until (i) the Regional Board's final approval date of the last outstanding portion of the PLANS, (ii) the CITY has provided the PARTIES with an accounting as set forth in paragraph (5)f, and (iii) the PARTIES have paid all outstanding invoices.
- (5) The CITY shall provide the services and performance as follows:
  - a. Upon final execution of this MOU, the CITY shall invoice the PARTIES for their share of the cost for the preparation and delivery of the PLANS as described in Exhibit A.
  - b. The CITY shall solicit proposals for, award, and administer a Consultant contract for the preparation and delivery of the PLANS.
  - c. The CITY will be compensated for the administration of the Consultant contract in the amount ten percent (10%) of the total contract amount.
  - d. The CITY shall utilize the funds deposited by the PARTIES only for the administration of the Consultant contract, project management, and the preparation and completion of the PLANS.
  - e. The CITY shall provide the PARTIES with an electronic copy of the completed PLANS.
  - f. The CITY shall provide an accounting upon the early termination of this MOU pursuant to paragraph (6)p or 60 days after the date the Regional Board gives final approval for the last outstanding portion of the PLANS. The CITY shall return the

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK WATERSHED EWMP AND CIMP

unused portion of all funds deposited with the CITY in accordance with the cost allocation formula set forth in Exhibit A.

- g. The CITY shall notify the PARTIES if the actual cost of the preparation of the PLANS will exceed the cost estimates shown on Exhibit A and obtain approval of the increase from all PARTIES. Upon approval of the cost increase by the PARTIES, City will invoice the PARTIES per cost allocation formulas on Exhibit A.
- h. The CITY shall instruct the Consultant to not submit any PLANS to the Regional Board unless and until the PLANS have been approved, in writing, for submittal by all PARTIES to this MOU, which approval will not be unreasonably withheld, excepting only any PARTY who has withdrawn from this MOU, .

(6) THE PARTIES FURTHER AGREE:

- a. To make a full faith effort to cooperate with one another to achieve the purposes of this MOU by providing information about project opportunities, reviewing deliverables in a timely manner, and informing their respective administrators, agency heads, and/or governing bodies.
- b. To fund the cost of the preparation and delivery of the PLANS and to pay the CITY for the preparation and delivery of the PLANS within 60 days of receiving an invoice. Funding shall be as specified in Exhibit A.
- c. To grant reasonable access rights and entry to the CITY and the Consultant during the terms of this MOU to the PARTY'S facilities (i.e. storm drains, channels, catch basins, properties, etc.) (collectively, THE FACILITIES) to achieve the purposes of this MOU, provided, however, that prior to entering any PARTY'S FACILITIES, the CITY or their Consultant shall secure a permit of entry from the applicable PARTY.
- d. The CITY shall require the Consultant retained pursuant to this MOU to agree to indemnify, defend, and hold harmless each PARTY, its special districts, elected and appointed officers, employees, and agents, from and against any and all liability, including but not limited to demands, claims, actions, fees, costs, and expenses (including attorney and expert fees), arising from or connected with the Consultant's performance of its agreement with CITY. In addition, the CITY shall require the Consultant to carry, maintain, and keep in full force and effect an insurance policy or policies, and each PARTY, its officers, employees, attorneys, and designated volunteers shall be named as additional insureds on the policy(ies) with respect to liabilities arising out of the Consultant's work.
- e. Each PARTY shall indemnify, defend, and hold harmless each other PARTY, including its special districts, elected and appointed officers, employees, and agents, from and

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK WATERSHED EWMP AND CIMP

- against any and all liability, including but not limited to demands, claims, actions, fees, costs, and expenses (including attorney and expert witness fees), arising from or connected with the respective acts of each PARTY arising from or related to this MOU; provided, however, that no PARTY shall indemnify another PARTY for that PARTY's own negligence or willful misconduct.
- f. In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the PARTIES hereto, pursuant to the authorization contained in Section 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees, by law for injury caused by any act or omission occurring in the performance of this MOU to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each PARTY indemnifies, defends, and holds harmless each other PARTY for any liability, cost, or expense that may be imposed upon such other PARTY solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.
  - g. The PARTIES are, and shall at all times remain as to each other, wholly independent entities. No PARTY to this MOU shall have power to incur any debt, obligation, or liability on behalf of any other PARTY unless expressly provided to the contrary by this MOU. No employee, agent, or officer of a PARTY shall be deemed for any purpose whatsoever to be an agent, employee, or officer of another PARTY.
  - h. Any notices, bills, invoices, or reports relating to this MOU, and any request, demand, statement, or other communication required or permitted hereunder shall be in writing and shall be delivered to the representatives of the PARTIES at the addresses set forth in Exhibit B.
  - i. This MOU shall be binding upon, and shall be to the benefit of the respective successors, heirs, and assigns of each PARTY; provided, however, neither PARTY may assign its respective rights or obligations under this MOU without the prior written consent of the other PARTIES.
  - j. This MOU is governed by, interpreted under, and construed and enforced in accordance with the laws of the State of California.
  - k. If any provision of this MOU shall be determined by any court to be invalid, illegal, or unenforceable to any extent, the remainder of this MOU shall not be affected, and this MOU shall be construed as if the invalid, illegal, or unenforceable provision had never been contained in this MOU.

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK WATERSHED EWMP AND CIMP

- i. All PARTIES have been represented by counsel in the preparation and negotiation of this MOU. Accordingly, this MOU shall be construed according to its fair language. Any ambiguities shall be resolved in a collaborative manner by the PARTIES and shall be rectified by amending this MOU as described in paragraph (6)o.
- m. Each of the persons signing below on behalf of a PARTY represents and warrants that he or she is authorized to sign this MOU on behalf of such PARTY.
- n. Each PARTY shall have no financial obligation to the other PARTIES of this MOU, except as herein expressly provided.
- o. The terms and provisions of this MOU may not be amended, modified, or waived, except by an instrument in writing signed by all PARTIES.
- p. Early Termination or Withdrawal
  - 1. This MOU may be terminated upon the express written agreement of all PARTIES. If this MOU is terminated, all PARTIES must agree on the equitable redistribution of remaining funds deposited, if there are any, or payment of invoices due at the time of termination. Completed work shall be owned by all PARTIES. Rights to uncompleted work by the Consultant still under contract will be held by the PARTY or PARTIES who fund the completion of such work.
  - 2. A PARTY may withdraw from this MOU upon 60 days written notice to the other PARTIES, subject to full payment of any current and future invoicing from CITY prior to or during the 60-day notice period for its share of the cost set forth in Exhibit A. The effective withdrawal date shall be the sixtieth (60<sup>th</sup>) day after CITY receives the withdrawing PARTY's notice to withdraw from this MOU. Withdrawal from this MOU does not release any PARTY from the obligations set forth in the MS4 Permit.
  - 3. If a PARTY fails to comply with any of the terms or conditions of this MOU, that PARTY shall forfeit its rights to work completed through this MOU, but no such forfeiture shall occur unless and until the defaulting PARTY has first been given notice of its default and a reasonable opportunity to cure the alleged default.

IN WITNESS WHEREOF, the PARTIES hereto have caused this MOU to be executed by their duly authorized representatives and affixed as of the date of signature of the PARTIES:

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

CITY OF CALABASAS

By \_\_\_\_\_ Date \_\_\_\_\_  
FRED GAINES, MAYOR

ATTEST:

By \_\_\_\_\_ Date \_\_\_\_\_  
MARICELA HERNANDEZ, MMC  
CITY CLERK

APPROVED AS TO FORM:

By \_\_\_\_\_  
SCOTT H. HOWARD, INTERIM CITY ATTORNEY

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

COUNTY OF LOS ANGELES

By \_\_\_\_\_ Date \_\_\_\_\_  
GAIL FARBER  
Director of Public Works

APPROVED AS TO FORM:

John F. Krattli  
County Counsel

By \_\_\_\_\_ Date \_\_\_\_\_  
Deputy

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By \_\_\_\_\_  
GAIL FARBER  
Chief Engineer

\_\_\_\_\_ Date

APPROVED AS TO FORM:

John F. Krattli  
County Counsel

By \_\_\_\_\_  
Deputy

\_\_\_\_\_ Date



MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

CITY OF AGOURA HILLS

By \_\_\_\_\_  
Denis Weber, Mayor

\_\_\_\_\_ Date

ATTEST:

By \_\_\_\_\_  
Kimberly Rodrigues, City Clerk

\_\_\_\_\_ Date

APPROVED AS TO FORM:

By \_\_\_\_\_  
Candice K. Lee, City Attorney

\_\_\_\_\_ Date

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

CITY OF HIDDEN HILLS

By \_\_\_\_\_  
Steve Freedland, Mayor

\_\_\_\_\_ Date

ATTEST:

By \_\_\_\_\_  
Cherie L. Paglia, City Manager

\_\_\_\_\_ Date

APPROVED AS TO FORM:

By \_\_\_\_\_  
Roxanne M. Diaz, City Attorney

\_\_\_\_\_ Date

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

CITY OF WESTLAKE VILLAGE

By \_\_\_\_\_  
Philippa Klessig, Mayor

\_\_\_\_\_  
Date

ATTEST:

By \_\_\_\_\_  
Beth Schott, City Clerk

\_\_\_\_\_  
Date

APPROVED AS TO FORM:

By \_\_\_\_\_  
Terence Boga, City Attorney

\_\_\_\_\_  
Date

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

**EXHIBIT A**

**Malibu Creek Watershed EWMP Funding Contributions**

Table 1: Project Cost

| Project Component   | Cost             |
|---|------------------|
| Consultant Contract   | \$600,000        |
| Contract Administration Fee (10 Percent of Consultant Contract) | \$60,000         |
| Total   | <b>\$660,000</b> |

The LACFCD will contribute 10 percent of the total project cost. Ten (10) percent of the remaining 90 percent of the total project cost will be distributed equally between the other PARTIES (i.e., the Cities of Agoura Hills, Calabasas, Hidden Hills, and Westlake Village; the County of Los Angeles; and Caltrans\*); this shall be known as the Base Fee. The remaining balance will be distributed based on the percent of the combined land area for which each PARTY is responsible.

Table 2: Agency Contributions

| Party                     | Base Fee | Land Area (Acres) | Percent of Land Area | Contribution Based on Land Area | Total               |
|---------------------------|----------|-------------------|----------------------|---------------------------------|---------------------|
| LACFCD                    | N/A      | N/A               | N/A                  | N/A                             | <b>\$66,000</b>     |
| City of Agoura Hills      | \$11,880 | 5,178             | 15.7%                | \$83,903.94                     | <b>\$95,783.94</b>  |
| City of Calabasas         | \$11,880 | 4,941             | 15.0%                | \$80,063.61                     | <b>\$91,943.61</b>  |
| City of Hidden Hills      | \$11,880 | 105               | 0.3%                 | \$1,701.41                      | <b>\$13,581.41</b>  |
| City of Westlake Village  | \$11,880 | 3,540             | 10.7%                | \$57,361.91                     | <b>\$69,241.91</b>  |
| County of Los Angeles     | \$11,880 | 19,228            | 58.3%                | \$311,569.13                    | <b>\$323,449.13</b> |
| Caltrans *                |          |                   |                      |                                 | <b>TBD</b>          |
| State Land Conservancy ** | -        | -                 | -                    | -                               | <b>TBD</b>          |
| State Parks **            | -        | -                 | -                    | -                               | <b>TBD</b>          |
| National Park Service **  | -        | -                 | -                    | -                               | <b>TBD</b>          |
| Total                     | \$59,400 | 32,992            | 100%                 | \$534,600                       | <b>\$660,000</b>    |

\* Caltrans will enter into a separate agreement with CITY.

\*\* This MOU shall be amended when National and State agencies decide to share the cost.

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

Table 4: Total Project Contributions

| Invoicing                | 1 <sup>st</sup> Invoice (40%)<br>July 2013 | 2 <sup>nd</sup> Invoice (40%)<br>July 2014 | 3 <sup>rd</sup> Invoice (20%)<br>January 2015 | Total               |
|--------------------------|--|--|---|---------------------|
| LACFCD                   | \$26,400.00                                | \$26,400.00                                | \$13,200.00                                   | <b>\$66,000</b>     |
| City of Agoura Hills     | \$38,313.58                                | \$38,313.58                                | \$19,156.78                                   | <b>\$95,783.94</b>  |
| City of Calabasas        | \$36,777.44                                | \$36,777.44                                | \$18,388.73                                   | <b>\$91,943.61</b>  |
| City of Hidden Hills     | \$5,432.56                                 | \$5,432.56                                 | \$2,716.29                                    | <b>\$13,581.41</b>  |
| City of Westlake Village | \$27,696.76                                | \$27,696.76                                | \$13,848.39                                   | <b>\$69,241.91</b>  |
| County of Los Angeles    | \$129,379.65                               | \$129,379.65                               | \$64,689.83                                   | <b>\$323,449.13</b> |
| Total                    | \$264,000                                  | \$264,000                                  | \$132,000                                     | <b>\$660,000</b>    |

Payment plan is optional. Any Agency may pay the full amount in July 2013.

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

EXHIBIT B

**Malibu Creek Watershed EWMP  
Responsible Agencies Representatives**

1. City of Agoura Hills  
30001 Lady Face Court  
Agoura Hills, 91301  
Party Representative: Kelly Fisher, Public Works Project Manager  
E-mail: [kfisher@ci.agoura-hills.ca.us](mailto:kfisher@ci.agoura-hills.ca.us)  
Phone: (818) 597-7338  
Fax: (818) 597-7352
2. City of Calabasas  
100 Civic Center Way  
Calabasas, CA 91302  
Party Representative: Alex Farassati  
E-mail: [afarassati@cityofcalabasas.com](mailto:afarassati@cityofcalabasas.com)  
Phone: (818) 224-1680  
Fax: (818) 225-7338
3. City of Hidden Hills  
6165 Spring Valley Road  
Hidden Hills, CA 91302  
Party Representative: Joe Bellomo  
E-mail: [jbello@willdan.com](mailto:jbello@willdan.com)  
Phone: (805) 279-6856  
Fax: (818) 719-0083
4. City of Westlake Village  
31200 Oak Crest Drive  
Westlake Village, 91361  
Party Representative: Joe Bellomo  
E-mail: [jbello@willdan.com](mailto:jbello@willdan.com)  
Phone: (805) 279-6856  
Fax: (818) 706-1391

MEMORANDUM OF UNDERSTANDING REGARDING THE ADMINISTRATION AND COST SHARING  
FOR DEVELOPMENT OF THE MALIBU CREEK EWMP AND CIMP

5. County of Los Angeles  
Department of Public Works  
Watershed Management Division, 11<sup>th</sup> Floor  
900 South Fremont Avenue  
Alhambra, CA 91803-1331  
Angela George  
E-mail: [ageorge@dpw.lacounty.gov](mailto:ageorge@dpw.lacounty.gov)  
Phone: (626) 458-4325  
Fax: (626) 457-1526
  
6. Los Angeles County Flood Control District  
Department of Public Works  
Watershed Management Division, 11<sup>th</sup> Floor  
900 South Fremont Avenue  
Alhambra, CA 91803-1331  
Gary Hildebrand  
E-mail: [GHILDEB@dpw.lacounty.gov](mailto:GHILDEB@dpw.lacounty.gov)  
Phone: (626) 458-4300  
Fax: (626) 457-1526



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*"Gateway to the Santa Monica Mountains National Recreation Area"*

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June 26, 2013

Samuel Unger, Executive Officer  
Los Angeles Regional Water Quality Control Board  
320 West Fourth Street, Suite 200  
Los Angeles, California 90013

Attention: Renee Purdy

**LETTER OF INTENT RELATED TO THE DEVELOPMENT OF AN ENHANCED  
WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED  
MONITORING PROGRAM**

Dear Mr. Unger;

The City of Agoura Hills, with this letter, pledges to collaborate with the Malibu Creek Watershed Group (Group) in the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) in accordance with the new MS4 Permit by Order No. R4-2012-0175 for submission to your Board.

The Malibu Creek Watershed Group includes the following agencies: The City of Agoura Hills, City of Calabasas, City of Hidden Hills, City of Westlake Village, County of Los Angeles and the Los Angeles County Flood Control District.

The City of Agoura Hills further pledges to cost share the development cost of both the Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP). A cost sharing formula has been agreed by all participating members of the Group as to the equitable distribution of costs.

Should you have any questions, please contact Ramiro Adeva at 818-597-7353 or [radeva@ci.agoura-hills.ca.us](mailto:radeva@ci.agoura-hills.ca.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Denis Weber", is written over a horizontal line.

Denis Weber  
Mayor

cc: Renee Purdy, LA Regional Water Quality Control Board  
Ivar Ridgeway, LA Regional Water Quality Control Board  
Alex Farassati, City of Calabasas





GAIL FARBER, Director

## COUNTY OF LOS ANGELES

### DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE  
REFER TO FILE: **WM-7**

June 24, 2013

Mr. Samuel Unger, P.E., Executive Officer  
California Regional Water Quality  
Control Board – Los Angeles Region  
320 West 4th Street, Suite 200  
Los Angeles, CA 90013

Attention Ms. Renee Purdy

Dear Mr. Unger:

**LETTER OF INTENT – COUNTY OF LOS ANGELES  
MALIBU CREEK WATERSHED GROUP  
ENHANCED WATERSHED MANAGEMENT PROGRAM  
AND COORDINATED INTEGRATED MONITORING PROGRAM**

The County of Los Angeles (County) submits this Letter of Intent to participate in and share the cost of the development of an Enhanced Watershed Management Program (EWMP) and a Coordinated Integrated Monitoring Program (CIMP) with the Malibu Creek Watershed Group. This Letter of Intent serves to satisfy the EWMP notification requirements of Section VI.C.4.b.iii(3) of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Malibu Creek Watershed Group consists of the following agencies: City of Calabasas as the coordinating agency for EWMP and CIMP development, County, Los Angeles County Flood Control District, and cities of Agoura Hills, Hidden Hills, and Westlake Village. The Malibu Creek Watershed Group has included a final draft Memorandum of Understanding as Attachment 2 of the Notice of Intent. The County intends to submit a final Memorandum of Understanding to its Board of Supervisors for approval prior to December 28, 2013.

Mr. Samuel Unger  
June 24, 2013  
Page 2

If you have any questions, please contact Ms. Angela George at (626) 458-4325 or  
ageorge@dpw.lacounty.gov.

Very truly yours,



*for* GAIL FARBER  
Director of Public Works

GC:jht

P:\wmpubl\Secretarial\2013 Documents\Letter\LOI MCW County.doc\C13226

cc: City of Agoura Hills  
City of Calabasas  
City of Hidden Hills  
City of Westlake Village



CITY of CALABASAS

June 10, 2013

Samuel Unger, Executive Officer  
Los Angeles Regional Water Quality Control Board  
320 West Fourth Street, Suite 200  
Los Angeles, California 90013

**SUBJECT: LETTER OF INTENT PLEDGING COMMITMENT IN THE DEVELOPMENT OF AN ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM IN COLLABORATION WITH THE MALIBU CREEK WATERSHED GROUP**

Dear Mr. Unger:

The City of Calabasas, with this letter, pledges to collaborate with the Malibu Creek Watershed Group (Group) in the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) in accordance with the new MS4 Permit by Order No. R4-2012-0175 for submission to Regional Water Quality Control Board.

The Malibu Creek Watershed Group includes the following agencies: The City of Agoura Hills, City of Calabasas, City of Hidden Hills, City of Westlake Village, County of Los Angeles and the Los Angeles County Flood Control District.

The City of Calabasas further pledges to cost share the development cost of both the Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP). A cost sharing formula has been agreed by all participating members of the Group as to the equitable distribution of costs.

100 Civic Center Way  
Calabasas, CA 91302  
(818) 224-1600  
Fax (818) 225-7324



June 10, 2013  
Samuel Unger, Executive Officer  
Page 2

Should you have any questions, please contact Dr. Alex Farassati, Environmental Services Supervisor, at (818) 224-1680 or via e-mail at [afarassati@cityofcalabasas.com](mailto:afarassati@cityofcalabasas.com).

Sincerely,



Anthony M. Coroalles  
City Manager

c: City Council  
Robert Yalda, Calabasas Public Works Director/City Engineer  
Alex Farassati, Malibu Creek Watershed EWMP & CIMP Coordinator  
Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region  
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region



## City of Hidden Hills

6165 Spring Valley Road • Hidden Hills, California 91302  
(818) 888-9281 • Fax (818) 719-0083

June 11, 2013

Samuel Unger, Executive Officer  
Los Angeles Regional Water Quality Control Board  
320 West Fourth Street, Suite 200  
Los Angeles, California 90013

**RE: LETTER OF INTENT PLEDGING COMMITMENT IN THE  
DEVELOPMENT OF AN ENHANCED WATERSHED  
MANAGEMENT PROGRAM AND COORDINATED INTEGRATED  
MONITORING PROGRAM IN COLLABORATION WITH THE  
MALIBU CREEK WATERSHED GROUP**

Dear Mr. Unger:

The City of Hidden Hills, with this letter, pledges to collaborate with the Malibu Creek Watershed Group (Group) in the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) in accordance with the new MS4 Permit by Order No. R4-2012-0175 for submission to your Board. The Group includes the following agencies: the City of Agoura Hills, the City of Calabasas, the City of Hidden Hills, the City of Westlake Village, Los Angeles County, and the Los Angeles County Flood Control District.

The City of Hidden Hills further pledges to cost share the development cost of both the EWMP and CIMP. A cost sharing formula has been agreed to by all participating members of the Group as to the equitable distribution of costs.

Samuel Unger  
Los Angeles Regional Water Quality Control Board  
June 11, 2013  
Page 2

Should you have any questions, please contact our Water Quality Consultant, Joe Bellomo, at jbellomo@willdan.com or at (805) 279-6856.

Sincerely,

CITY OF HIDDEN HILLS



Steve Freedland  
Mayor

SF/dlg

cc: Cherie L. Paglia, City Manager  
Joe Bellomo, Willdan Engineering  
Renee Purdy, California Regional Water Quality Control Board, Los Angeles Region  
Ivar Ridgeway, California Regional Water Quality Control Board, Los Angeles Region  
Alex Farassati, City of Calabasas



GAIL FARBER, Director

## COUNTY OF LOS ANGELES

### DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE  
REFER TO FILE: WM-7

June 24, 2013

Mr. Samuel Unger, P.E.  
Executive Officer  
California Regional Water Quality  
Control Board – Los Angeles Region  
320 West 4th Street, Suite 200  
Los Angeles, California 90013

Attention Ms. Renee Purdy

Dear Mr. Unger:

**LETTER OF INTENT – LOS ANGELES COUNTY FLOOD CONTROL DISTRICT  
MALIBU CREEK WATERSHED GROUP  
ENHANCED WATERSHED MANAGEMENT PROGRAM  
AND COORDINATED INTEGRATED MONITORING PROGRAM**

The Los Angeles County Flood Control District (LACFCD) submits this Letter of Intent to participate in and share the cost of the development of an Enhanced Watershed Management Program (EWMP) and a Coordinated Integrated Monitoring Program (CIMP) with the Malibu Creek Watershed Group. This Letter of Intent serves to satisfy the EWMP notification requirements of Section VI.C.4.b.iii(3) of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Malibu Creek Watershed Group consists of the following agencies: City of Calabasas as the coordinating agency for EWMP and CIMP development, County of Los Angeles, LACFCD, and cities of Agoura Hills, Hidden Hills, and Westlake Village. The Malibu Creek Watershed Group has included a final draft Memorandum of Understanding as Attachment 2 of the Notice of Intent. The LACFCD intends to submit a final Memorandum of Understanding to the County of Los Angeles Board of Supervisors (which is the LACFCD's governing body) for approval prior to December 28, 2013.

Mr. Samuel Unger  
June 24, 2013  
Page 2

If you have any questions, please contact Ms. Terri Grant at (626)458-4309 or  
tgrant@dpw.lacounty.gov.

Very truly yours,



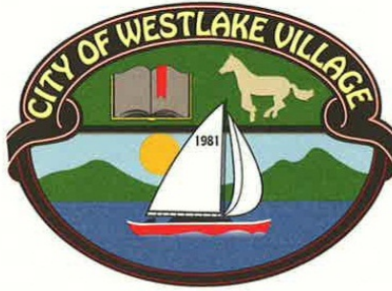
<sup>161</sup> GAIL FARBER  
Chief Engineer of the Los Angeles County Flood Control District

GC:jht

P:\wmpub\Secretarial\2013 Documents\Letter\LOI MCW LACFCD.doc\C13227

cc: City of Agoura Hills  
City of Calabasas  
City of Hidden Hills  
City of Westlake Village





PHILIPPA KLESSIG  
Mayor

ROBERT SLAVIN  
Mayor Pro Tem

MARK RUTHERFORD  
Councilmember

NED E DAVIS  
Councilmember

SUSAN McSWEENEY  
Councilmember

June 28, 2013

Samuel Unger, Executive Officer  
Los Angeles Regional Water Quality Control Board  
320 West Fourth Street, Suite 200  
Los Angeles, California 90013

**SUBJECT: LETTER OF INTENT PLEDGING COMMITMENT IN THE DEVELOPMENT OF AN ENHANCED WATERSHED MANAGEMENT PROGRAM AND COORDINATED INTEGRATED MONITORING PROGRAM IN COLLABORATION WITH THE MALIBU CREEK WATERSHED GROUP**

Dear Mr. Unger;

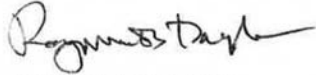
The City of Westlake Village, with this letter, will participate with the Malibu Creek Watershed Group (Group) in the development of an Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP) in accordance with the new MS4 Permit by Order No. R4-2012-0175 for submission to your Board.

The Malibu Creek Watershed Group includes the following agencies: the City of Agoura Hills, City of Calabasas, City of Hidden Hills, City of Westlake Village, County of Los Angeles and the Los Angeles County Flood Control District.

The City of Westlake Village further pledges to share in the development cost of both the Enhanced Watershed Management Program (EWMP) and Coordinated Integrated Monitoring Program (CIMP). A cost sharing formula has been agreed to by all participating members of the Group as to the equitable distribution of costs.

Should you have any questions, please contact Joe Bellomo at (805) 279-6856 or at [jbello@willdan.com](mailto:jbello@willdan.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Raymond B. Taylor". The signature is fluid and cursive, with a long horizontal stroke at the end.

Raymond B. Taylor  
City Manager

cc: Renee Purdy, California Regional Water Quality Control Board,  
Los Angeles Region  
Ivar Ridgeway, California Regional Water Quality Control Board,  
Los Angeles Region  
Alex Farassati, Malibu Creek Watershed EWMP & CIMP Coordinator

**Attachment 3**  
**Structural BMPs Fact Sheets**



CITY of CALABASAS

**Citywide Smart Irrigation Control**

This project calls for the installation of a smart irrigation control system using evapotranspiration (ET) technology. This system would be put into place at all City-owned facilities, street medians and parkways. Citywide Smart Irrigation Control Project is necessary because it will reduce irrigation run off and prevents pollutants from reaching Las Virgenes Creek, Malibu Creek, Santa Monica Bay, Dry Canyon Creek, McCoy Creek and the Los Angeles River. This project will also will reduce city irrigation usage by approximately 20-25% thus reducing the amount of potable and reclaimed water supplied by the Las Virgenes Municipal Water District (LVMWD).

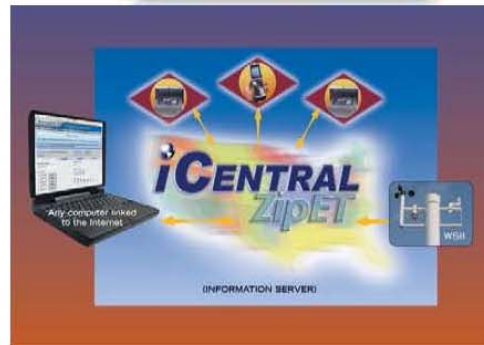
**Features:**

- Weather based evapotranspiration (ET) controller system
- Saves 20% or more over conventional Non-ET controllers
- Measure flow and monitors system efficiency
- Receive text alerts for a variety of problems
- Remote monitoring through a computer based software



**Project Components**

- Install smart irrigation control system at all City-owned Facilities, Street Medians and Parkways
- Reduce irrigation usage by 20-25% at applicable sights
- Reduce irrigation runoff to Malibu Creek and Los Angeles watersheds
- Retrofit and or replace 64 controllers and 819 sprinkler valves
- Utilize specific weather data based on city's weather conditions and regional data input



**Conservation of Water Usage & Run-off Reduction**

City uses 66,431 gallons of water on annual basis for landscape irrigation. It's anticipated that with the new system city will save between 13,300 to 16,600 gallons of water. It will translate to approximately 5,000 to 7,000 gallon of reduction in run-off.





## Lindero Channel Parkway Improvements

### Project Description:

This Lindero Channel Parkway Improvement project is part of an overall City of Westlake Village streetscape improvement project that creates infiltration and urban pollutant mitigation opportunities along all arterial medians and parkways.

This portion of the overall project is 30 foot wide by over a mile long, and will be recreated to have a Riparian Zone theme. Half of this parkway was originally a flood control maintenance road and the other half a conventional landscaped area. The combined width of the old maintenance road and landscaped area will provide an opportunity for a new long and meandering walking path with conversation seating areas next to educational signage on a riparian zone and the stormwater cleanup objectives of this project. The newly renovated area will drain to bio-swales throughout the entire length of the project. These swales will meander thru the entire length with the main goal of percolation and evaporation of all nuisance flows throughout the year.

### Estimated Cost:

\$2.1 Million



Figure 2: After Photo showing bio-swale eliminating runoff and providing pollutant mitigation via infiltration.



Figure 1: Before Photo with concave design and no infiltration.

### Project Features:

- ✓ Comply with water quality regulations (including TMDLs) by improving the quality of urban runoff, and stormwater
- ✓ Bio-swales and other infiltration galleries to address nuisance flow throughout the year
- ✓ Provides weather based evapo-transpiration (ET) controller which saves 25% or more over conventional Non-ET controllers
- ✓ Incorporates educational signage with a focus on the importance of being a steward to a healthy watershed





**MEMORANDUM**

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**Date:** December 11, 2013  
**Organization:** City of Westlake Village  
**To:** Joe Bellomo,  
Stormwater Program Manager  
**From:** Leroy Cadena  
**Title:** Senior Engineer  
**Project Name:** Lindero Linear Park Construction Documents  
**Project Number:** 1313063  
**Topic:** Response to RWQCB Letter Dated November 26, 2013

---

This memo is in response to RWQCB’s letter dated November 26, 2013, regarding the RWQCB’s review of the Malibu Creek Watershed Group Notification of Intent (NOI). In the November 26<sup>th</sup> letter, the RWQCB directed the following comment to the City of Westlake Village regarding the proposed Lindero Canyon Road improvements:

“...provide quantification of the amount of stormwater runoff the bioswales will treat. Specifically, will the bioswales treat the storm intensity of the 85<sup>th</sup> percentile, 24-hr storm event.”

RRM has reviewed the comment, along with the proposed Lindero Canyon Road pathway layout, and proposes the following response:

The Phase 1 portion (from Agoura Road to Rustic Oak Drive) of the project includes removing 633 sf of sidewalk and installing 16,621 sf of pathway. This phase of the project is about 2,361 linear feet long and the average slope is about 1.75%. The bioswales for Phase 1 are planned to treat a minimum of 1,300 cubic feet of water prior to entering directly into the flood control channel.

Phase 2 portion (from Rustic Oak Drive to Foxfield Drive) of the project includes removing 10,629 sf of existing sidewalk and installing 19,638 sf of pathway. Phase 2 is about 2,438 linear feet long and has an average slope 1.0%. Phase 2 bioswales will treat a minimum of 450 cubic feet of water prior to entering directly into the flood control channel.

[www.rrmdesign.com](http://www.rrmdesign.com)

ARCHITECTS | ENGINEERS | LANDSCAPE ARCHITECTS | PLANNERS | SURVEYORS  
A California Corporation | Victor Montgomery, Architect #C11090 | Jerry Michael, PE #36895, LS #6276 | Jeff Ferber, LA #2844

Printed on recycled paper



Response to RWQCB Letter Dated November 26, 2013  
December 11, 2013  
Page 2 of 2

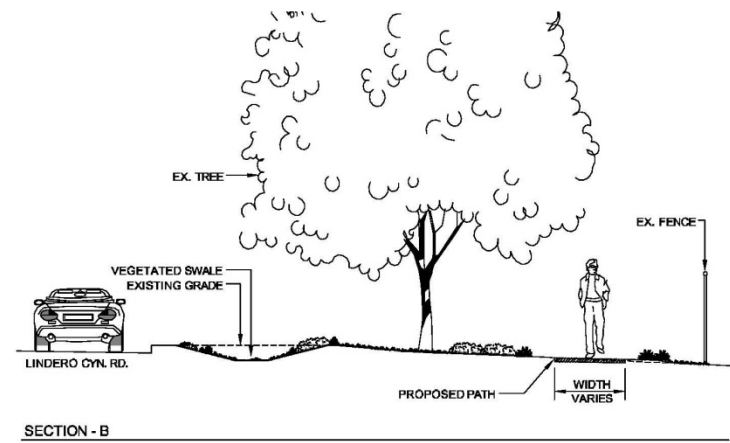
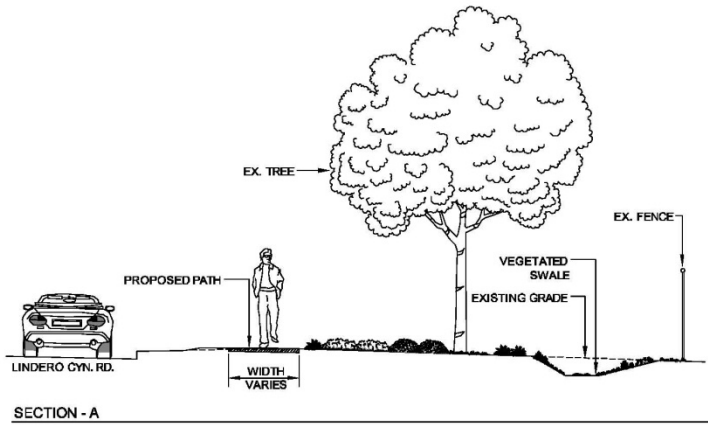
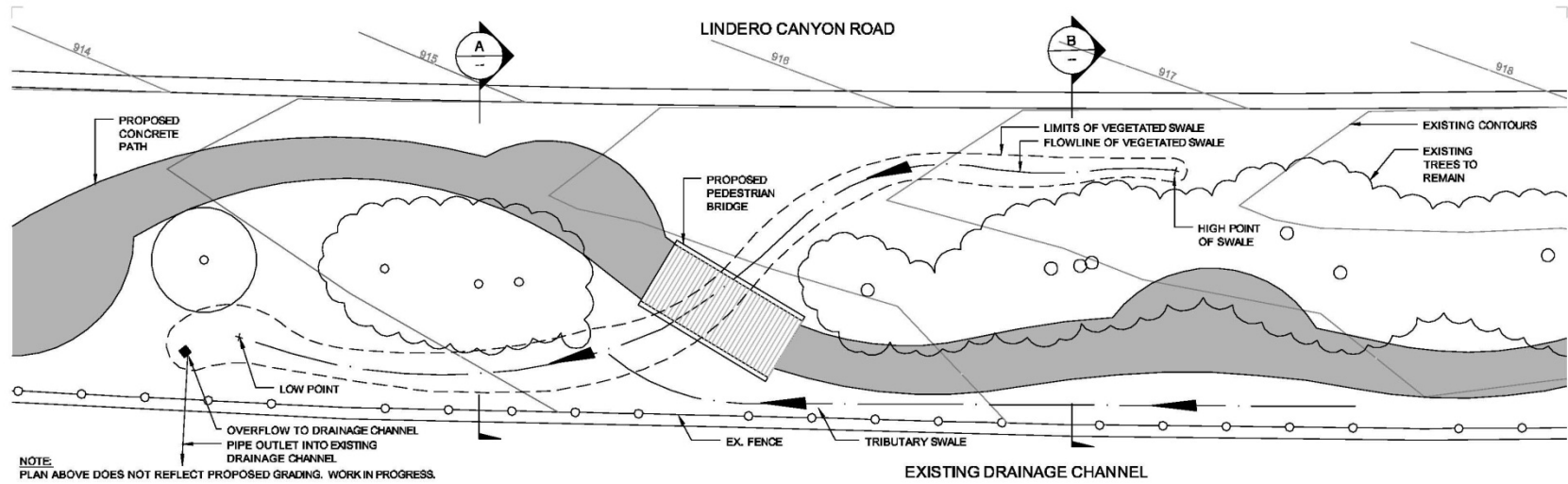
Runoff volumes were calculated using the Los Angeles County's "TC\_Calc\_Vol.xls" spreadsheet with specific site information such as project area, length, slope, percent imperviousness, and the following regional parameters:

- An Isohyet of 1.2" obtained from Figure 2-8, Draft Los Angeles River Metals TDML Implementation Plan
- A soil type of 68 obtained from the Los Angeles County's Thousand Oaks, 50 year 24-Hour Isohyet Map

Credit was taken for exiting sidewalk being replaced and that all flows would outlet directly to the flood control channel. These calculations do not include run on from adjacent streets.

Calculations are attached for your review.

cc: John Knipe, City Engineer, City of Westlake Village  
Jeffery Ferber, Principal, RRM Design Group  
Jerry Michaels, Principal, RRM Design Group  
Chris Dufour, Senior Landscape Architect, RRM Design Group





RRM DESIGN GROUP  
 Creating Environments People Enjoy  
 3765 South Figueroa St., Ste. 102, San Luis Obispo, CA 93401  
 Tel: 805/543-7794 Fax: 805/543-4609 www.rrmdesign.com  
 V. Montgomery, Arkansas - 5/19/01 J. Mitchell, BCC 5/18/01 J. Forbes, LA 5/18/01

JOB Lindero Canyon Rd  
 SHEET NO. 1 OF \_\_\_\_\_  
 CALCULATED BY HLL DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SCALE NOTICE

Phase I Runoff Calculations

Acres = 1.78 ac

Total Flow length = 2,361'

Average slope = 1.75%

Ext Sidewalk = 633 sf

Proposed Walkway = 16,621 sf

Existing Imp = 0.0082

Post Const Imp = 0.1214

Site Rainfall Isohyet = 1.211 85% storm  
 from Figure 2-8 Draft  
 Los Angeles River Metals TMDL  
 Implementation Plan

Soil Type: 6B from L.A. County Thousand Oaks  
 50yr - 24 hour Isohyet Map  
 (also shows soil types)

Pre Runoff volume = 0.02 acre-ft  
 Post Runoff volume = 0.05 acre-ft  
 net increase = 0.03 acre-ft  
 = 1,307 cubic ft





RRM DESIGN GROUP  
 Creating Environments People Enjoy  
 3765 South Figueroa St., Ste. 103 San Luis Obispo, CA 93401  
 Ph: 805/543-3794 Fax: 805/543-1609 www.rrmdesign.com  
 V. Montgomery, Arkansas 11/2000 J. Michael, RCI 5/2001 L.S. Noye 1/2002 L.A. 5/2002

JOB Lindero Canyon Rd  
 SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 CALCULATED BY ALC DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SCALE \_\_\_\_\_

Phase I Runoff Calc's

Acres = 1.56 ac

Total Flow length = 2,438'

Average Slope = 1%

Ext Sidewalk = 10,629 S.F.

Prop. Sidewalk = 19,628 S.F.

Ext Imp = .16

Post Const Imp. = .29

Site Rainfall Isohyet = 1.2" see note p1

Soil Type = 68 see note p1

|                       |              |
|-----------------------|--------------|
| Pre Run Off Volume =  | 0.04 acre-ft |
| Post Run Off Volume = | 0.05 acre-ft |
| Net Increase =        | 0.01 acre-ft |

### Lindero Canyon Road Trapezoidal Swale Calculations

| Depth<br>(FT) | BTM Width<br>(FT) | side slope<br>(:1) | Length<br>(FT) | Top width<br>(FT) | Sec Area<br>(S.F.) | Volume<br>(Acre-Ft) |
|---------------|-------------------|--------------------|----------------|-------------------|--------------------|---------------------|
| 1             | 2                 | 4                  | 225            | 10                | 6                  | 0.03                |
| 1             | 2                 | 4                  | 75             | 10                | 6                  | 0.01                |

**Tc Calculator**
✕

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**Subarea Parameters Manual Input**

|                        |                        |                 |
|------------------------|------------------------|-----------------|
| Subarea Number         | Fire Factor            |                 |
| Phase 1 pre            | 0                      |                 |
| Area (Acres)           | Proportion Impervious  | Soil Type       |
| 1.78                   | .0082                  | 68              |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |
| 1.2                    | 2361                   | .0175           |

**Subarea Parameters Selected**

|                        |                        |                 |
|------------------------|------------------------|-----------------|
| Subarea Number         | Fire Factor            |                 |
| 1a                     | 0                      |                 |
| Area (Acres)           | Proportion Impervious  | Soil Type       |
| 1.78                   | 0.0082                 | 68              |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |
| 1.2                    | 2361                   | 0.0175          |

---

**Input File**

Check Here If Subarea Parameters Are Defined In An Input File

Calculate Single Tc From Subarea Parameters Provided In Input File

Calculate Tc's For Multiple Subareas And Create Tc Results File

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**Calculation Results**

| Subarea Number | Intensity | Undeveloped Runoff Coefficient (Cu) | Developed Runoff Coefficient (Cd) |  |
|----------------|-----------|-------------------------------------|-----------------------------------|--|
| Phase 1 pre    | 0.31      | 0.1                                 | 0.11                              |  |

Calculate Runoff Volume

---

**Tc Equation**

$T_c = (10)^{-0.507} * (Cd * I)^{-0.519} * (L)^{0.483} * (S)^{-0.135}$

| Tc Value (min.) | Peak Flow Rate (cfs) | Burned Peak Flow Rate (cfs) | 24-Hour Runoff Volume (acre-ft) |
|-----------------|----------------------|-----------------------------|---------------------------------|
| 30              | 0.06                 | 0.06                        | 0.02                            |

X
Tc Calculator

**Subarea Parameters Manual Input**

|                        |                        |                 |
|------------------------|------------------------|-----------------|
| Subarea Number         | Fire Factor            |                 |
| Phase 1 post           | 0                      |                 |
| Area (Acres)           | Proportion Impervious  | Soil Type       |
| 1.78                   | .214                   | 68              |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |
| 1.2                    | 2361                   | .0175           |

**Subarea Parameters Selected**

|                        |                        |                 |
|------------------------|------------------------|-----------------|
| Subarea Number         | Fire Factor            |                 |
| 1a                     | 0                      |                 |
| Area (Acres)           | Proportion Impervious  | Soil Type       |
| 1.78                   | 0.214                  | 68              |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |
| 1.2                    | 2361                   | 0.0175          |

**Input File**

Check Here If Subarea Parameters Are Defined In An Input File

Import "tcddata.xls" File

Calculate Single Tc From Subarea Parameters Provided In Input File

Calculate Tc's For Multiple Subareas And Create Tc Results File

**Calculation Results**

|                |           |                                     |                                   |   |
|----------------|-----------|-------------------------------------|-----------------------------------|---|
| Subarea Number | Intensity | Undeveloped Runoff Coefficient (Cu) | Developed Runoff Coefficient (Cd) | <input checked="" type="checkbox"/> Calculate Runoff Volume |
| Phase 1 post   | 0.31      | 0.1                                 | 0.27                              | <input type="button" value="Calculate T"/>                  |

Tc Equation

$Tc = (10)^{-0.507 * (Cd * I)^{-0.519 * (L)^{0.483 * (S)^{-0.135}}$

|                 |                      |                             |                                 |
|-----------------|----------------------|-----------------------------|---------------------------------|
| Tc Value (min.) | Peak Flow Rate (cfs) | Burned Peak Flow Rate (cfs) | 24-Hour Runoff Volume (acre-ft) |
| 30              | 0.15                 | n/a                         | 0.05                            |

**Tc Calculator** ✕

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**Subarea Parameters Manual Input**

|                        |                        |                 |  |
|------------------------|------------------------|-----------------|--|
| Subarea Number         | Fire Factor            |                 |  |
| Phase 2 pre            | 0                      |                 |  |
| Area (Acres)           | Proportion Impervious  | Soil Type       |  |
| 1.56                   | .1567                  | 68              |  |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |  |
| 1.2                    | 2438                   | .01             |  |

**Subarea Parameters Selected**

|                        |                        |                 |  |
|------------------------|------------------------|-----------------|--|
| Subarea Number         | Fire Factor            |                 |  |
| 1a                     | 0                      |                 |  |
| Area (Acres)           | Proportion Impervious  | Soil Type       |  |
| 1.56                   | 0.1567                 | 68              |  |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |  |
| 1.2                    | 2438                   | 0.01            |  |

---

**Input File**

Check Here If Subarea Parameters Are Defined In An Input File

Calculate Single Tc From Subarea Parameters Provided In Input File

Calculate Tc's For Multiple Subareas And Create Tc Results File

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**Calculation Results**

|                |           |                                     |                                   |   |  |
|----------------|-----------|-------------------------------------|-----------------------------------|---|--|
| Subarea Number | Intensity | Undeveloped Runoff Coefficient (Cu) | Developed Runoff Coefficient (Cd) | <input checked="" type="checkbox"/> Calculate Runoff Volume |  |
| Phase 2 pre    | 0.31      | 0.1                                 | 0.23                              | <input type="button" value="Calculate T"/>                  |  |

**Tc Equation**

$Tc = (10)^{-0.507} * (Cd * I)^{-0.519} * (L)^{0.483} * (S)^{-0.135}$

|                 |                      |                             |                                 |
|-----------------|----------------------|-----------------------------|---------------------------------|
| Tc Value (min.) | Peak Flow Rate (cfs) | Burned Peak Flow Rate (cfs) | 24-Hour Runoff Volume (acre-ft) |
| 30              | 0.11                 | n/a                         | 0.04                            |

X
Tc Calculator

**Subarea Parameters Manual Input**

|                        |                        |                 |  |
|------------------------|------------------------|-----------------|--|
| Subarea Number         | Fire Factor            |                 |  |
| Phase 2 post           | 0                      |                 |  |
| Area (Acres)           | Proportion Impervious  | Soil Type       |  |
| 1.56                   | 0.29                   | 68              |  |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |  |
| 1.2                    | 2438                   | .01             |  |

**Subarea Parameters Selected**

|                        |                        |                 |  |
|------------------------|------------------------|-----------------|--|
| Subarea Number         | Fire Factor            |                 |  |
| 1a                     | 0                      |                 |  |
| Area (Acres)           | Proportion Impervious  | Soil Type       |  |
| 1.56                   | 0.29                   | 68              |  |
| Rainfall Isohyet (in.) | Flow Path Length (ft.) | Flow Path Slope |  |
| 1.2                    | 2438                   | 0.01            |  |

**Input File**

Check Here If Subarea Parameters Are Defined In An Input File

Import "tcdata.xls" File

Calculate Single Tc From Subarea Parameters Provided In Input File  
 Calculate Tc's For Multiple Subareas And Create Tc Results File

**Calculation Results**

|                |           |                                     |                                   |   |
|----------------|-----------|-------------------------------------|-----------------------------------|---|
| Subarea Number | Intensity | Undeveloped Runoff Coefficient (Cu) | Developed Runoff Coefficient (Cd) | <input checked="" type="checkbox"/> Calculate Runoff Volume |
| Phase 2 post   | 0.31      | 0.1                                 | 0.33                              |   |

Calculate T  
Cancel

Tc Equation

$Tc = (10)^{-0.507} * (Cd * I)^{-0.519} * (L)^{0.483} * (S)^{-0.135}$

|                 |                      |                             |                                 |
|-----------------|----------------------|-----------------------------|---------------------------------|
| Tc Value (min.) | Peak Flow Rate (cfs) | Burned Peak Flow Rate (cfs) | 24-Hour Runoff Volume (acre-ft) |
| 30              | 0.16                 | n/a                         | 0.05                            |