

**STUDY WORK PLAN  
FOR  
ENGINEERED EARTHEN-BOTTOM FLOOD CONTROL CHANNELS  
LOCATED WITHIN THE  
LOS ANGELES RIVER WATERSHED**

**MAINTAINED AND OPERATED BY THE  
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT**

**IN COMPLIANCE WITH THE  
WASTE DISCHARGE REQUIREMENTS  
FILE NUMBER 99-011-2010WDR**

**PREPARED FOR:**

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## Table of Contents

1. Introduction.....	1
2 Feasibility Study Requirements.....	1
3. Approach.....	3
4. Work Plans.....	4
4.1 Hydraulic Analysis.....	4
4.1.1. Location.....	4
4.1.2. Objective.....	5
4.1.3. Office and Field Investigations.....	5
4.1.4. Hydraulic Analysis Modeling.....	6
4.1.5. Hydraulic Analysis Report.....	8
4.2. Biological Technical Assessments.....	8
4.2.1. Literature Review.....	8
4.2.2. Field Surveys.....	9
4.2.3. Vegetation Transect Data Collection.....	9
4.2.4. Focused Surveys for Special Status Plant Species.....	11
4.2.5. Focused Surveys for Threatened and Endangered Wildlife Species.....	11
4.2.6. Biological Technical Assessment Report.....	12
4.2.7. Recommendations.....	12
4.3. Water Quality Monitoring and Best Management Practices Plan (BMP).....	13
4.3.1 Pre-Project Monitoring.....	15
4.3.2 Project Monitoring.....	15
4.3.3 Post-Project Monitoring.....	16
4.3.4 Best Management Plan.....	16
4.3.5 Water Quality Data Analysis Submittal.....	17
4.4 Stakeholders Solicitation.....	17
4.4.1 Objective.....	17
4.4.2 Stakeholder Identification.....	17
4.4.3 Soliciting Stakeholder Input.....	17
4.4.4 Technical Assessment Report and Recommendations.....	18
4.4.5 Information Access on LACFCD Internet Website.....	18
4.4.6 LACFCD Internet Website for Soft-Bottom Channel Maintenance.....	18

## List of Figures

Figure 1 Map of the Los Angeles County Soft-Bottom Reaches

Figure 2 Los Angeles River Watershed Map with Channel Reach Locations

## List of Tables

Table 1 List of Soft-Bottom Channels within the Los Angeles River Watershed

## **Attachments**

- Attachment 1 Waste Discharge Requirements for Los Angeles County Flood Control District, Proposed Maintenance Clearing of Engineered Earth-Bottom Flood Control Channels, Los Angeles County (Order No R4-2010-0021)
- Attachment 2 Sample Copy of a Shot of a Stream Channel Transect
- Attachment 3 Sample of a Completed Comparison of Species Composition and Coverage Data Sheet
- Attachment 4 Sample Form used by Biologists during Transect Data Survey
- Attachment 5 Sample Water Quality Monitoring (WQ) Field Data Sheet
- Attachment 6 Sample of a Chain of Custody Form
- Attachment 7 Sample copy of a Completed WQ Sampling Monitoring Test and Lab Result
- Attachment 8 Best Management Practices (BMP) Manual for Soft-Bottom Channel Clearing
- Attachment 9 Stakeholder's Initial Email Notification – Request for Review and Comment on the Draft Study Workplan
- Attachment 10 Stakeholder's Comments/Response to Draft Study Workplan

## **1. Introduction**

The Los Angeles County Flood Control District (LACFCD) owns and maintains numerous engineered soft-bottom flood control channels within the County of Los Angeles (County). These channels convey storm flows from the open space and urban areas within their tributary watersheds. The LACFCD conducts annual maintenance on these facilities to protect life and property from potential flooding, fire hazards, and vector nuisance issues, so facilities may function as designed.

In order to maintain these facilities, LACFCD obtains environmental regulatory permits from the Los Angeles Regional Water Quality Control Board (Regional Board). The Regional Board has jurisdiction over water quality issues, under Section 401 Water Quality Certification, on activities performed at facilities located within the waters of the United States. Other regulatory agencies that have jurisdiction over these facilities include the California Department of Fish and Game (CDFG) and the U.S. Army Corps of Engineers (COE).

Maintenance activities within these facilities have been and continue to be performed according to valid regulatory permits with these agencies. Prior to expiration of these regulatory permits, LACFCD is responsible for obtaining new permits or extensions.

On February 4, 2010, the Regional Board adopted the Waste Discharge Requirements (WDR), Order No. R4-2010-0021, for the maintenance of the aforementioned soft-bottom flood control channels (project). See Attachment 1 for a copy of the WDR. The adopted WDR includes additional conditions that were not part of Section 401 Water Quality Certification, previously issued for the project. As part of the WDR, a Feasibility Study is required to be conducted within six years for all the earth-bottom channels in each watershed within the County. For the first year, a Feasibility Study is required for the Los Angeles River Watershed. This report addresses that first year's requirement.

## **2. Feasibility Study Requirements**

Conditions 44 through 51 of the WDR require that a Feasibility Study be conducted to determine whether the "channel clearing activities have avoided, minimized, or appropriately mitigated for effects on the beneficial uses of the affected reaches or to require changes to channel clearing activities to achieve the necessary avoidance, minimization or mitigation."

For clarity and reference to the technical basis of this report, complete language of specific permit conditions of the WDR are provided throughout this report.

Condition 45, Feasibility Study and Stakeholders' Notification, states.

"As part of the on-going assessment of channel conditions and hydraulic capacity, LACFCD shall perform a study of the hydraulic capacity and existing conditions of all reaches covered by this WDR to determine where a potential may exist for native vegetation to remain within the soft-bottom portion of the channel or if additional hydraulic capacity is needed (Feasibility Study) In addition, any channels which may potentially provide restoration opportunities for riparian habitat/vegetation growth shall be identified based on these assessments and a consideration of restoration plans by other agencies LACFCD shall implement the Feasibility Study process with a schedule of one or more watersheds per year to be analyzed, with completion of all watersheds/studies within six (6) years LACFCD shall solicit stakeholder input during the Feasibility Study Work Plan development and prior to the finalization of the Technical Assessment Report and Recommendations." Figure 1 is a map of the County showing locations of all soft-bottom channels by watershed.

Condition 46, Required Watershed for Year One Feasibility Study, states.

"In the first year, the Feasibility Study shall be required for the Los Angeles River Watershed (which includes the mainstem reaches and all tributaries, including Compton Creek, covered by this WDR) See Figure 2 for locations of soft-bottom channels within the Los Angeles River Watershed. The study area shall include any channels directly or indirectly affected by proposed maintenance. Each year, LACFCD and the Regional Board Executive Officer shall determine in which watershed(s) the Feasibility Study shall be conducted in the subsequent year "

Condition 47, Feasibility Study Components, states

"For each watershed, the Feasibility Study shall include (but not be limited to) the following components

- a Study Workplan
- b Technical Assessment Report
- c. Recommendations"

This report complies with the Study Workplan requirement of Condition 47

Condition 48, Study Workplans, states

"Within 5 months of WDR issuance, a Workplan for the first watershed shall be submitted to the Regional Board Executive Officer for approval. The plan will include a detailed plan for a hydraulic analysis of each earth-bottom segment in relation to the conveyance capacity of the upstream and downstream channels, in addition to the Water Quality Monitoring The hydraulic analysis shall include, but not limited to, the height and density of vegetation in the

earthen channel bottom and its effect on the conveyance capacity of flood flow in the channel and shall include discussion of changes in expected stream flow in response to requirements of the Los Angeles County Municipal Separate Storm Sewer (MS4) NPDES Permit, Standard Urban Stormwater Mitigation Plans (SUSMPs), Total Maximum Daily loads (TMDLs) and other pertinent local plans including, but not limited to the Integrated/Regional Water Management Plan (IRWMP) (including implementation of, and plans for, increased stormwater infiltration), the City of Los Angeles' Integrated Resources Plan, the relevant watershed master plan and the LACFCD's Drought Management Plan. Several reasonable Manning's Numbers should be used in the hydraulic analysis to evaluate the representative height of the channel for flood control and natural habitat purposes and should be in accordance with "Guide for Selecting Manning's Roughness coefficients for Natural Channels and Flood Plains," United States Geological Survey Water-Supply Paper 2339 or other appropriate guidance

The assessment of biological functions and values of these reaches should be made such that comparisons of habitat type, maturity and extent of native or invasive plants can be made between reaches "

### **3. Approach**

To comply with the first component of the Feasibility Study, a Study Workplan (Workplan) for engineered earth-bottom channels within the Los Angeles River Watershed is proposed for the first year. This Workplan will outline the methodology, steps, and procedures of how the hydraulic study, biological studies, water quality monitoring, and stakeholders' notification will be performed and coordinated.

In addition, the Workplan includes discussion and an outline of how the second and third components of the Feasibility Study (i.e., Technical Assessment Report and Recommendations) will be accomplished.

The following are the specific WDR permit conditions related to the last two components of the Feasibility Study:

Condition 50, Technical Assessment Report – Hydraulic and Water Quality Assessment, states

"Within 7 months of Workplan approval, a Technical Assessment Report shall be submitted and will include a reach-by-reach list of all the reaches included in the subject watershed with a hydraulic analysis of each reach

This report will also include an assessment of the biological functions and values for each reach and an assessment of water quality, as required. For each reach, the report shall address capacity requirements for flood control, design criteria

and anticipated limitations, and an analysis either of potential areas where vegetation may remain and areas with the potential for restoration of native vegetation or where justification exists to clear additional vegetated areas. For those areas where vegetation may remain, the technical assessment report should specify the amount(s) and type(s) of native vegetation that could remain in the channel.”

Condition 51, Recommendation, states

“Within 7 months of Workplan approval, recommendations shall be submitted to the Regional Board Executive Officer and shall include options for reaches where vegetation may be allowed to remain or where native vegetation could be re-established. Recommendations shall also include suggested schedules of vegetation removal frequency in order to ensure the maximum habitat preservation, consistent with necessary flood control, is achieved. For recommendations approved by the Executive officer, LACFCD shall make the necessary changes to the Maintenance Plan, including proposals for additional BMP’s as may be appropriate, and shall submit such changes to the Executive officer 21 days prior to any clearing activities.”

## **4. Workplans**

As previously noted earlier, Condition 48 of the WDR requires the LACFCD to submit a Workplan for review and approval to the Regional Board’s Executive Officer. After its approval, LACFCD will submit the required Technical Assessment Report and the Recommendations.

The following sections outline the steps that are necessary to develop the technical report and recommendations that are needed to complete the Feasibility Study

### **4.1 *Hydraulic Analysis***

#### **4.1.1 Location**

The project is located in the Los Angeles River Watershed. There are 26 defined soft-bottom reaches in the Regional Board’s WDR within the Los Angeles River Watershed. These 26 channel reaches vary in length from 25 feet to as long as 11,000 feet (see Table 1 for a complete listing and details of all 26 channel reaches)

#### **4.1.2 Objective**

- A. Prepare HEC-RAS hydraulic models using the COE Hydrologic Engineering Center River Analysis System computer program for the 26 soft-bottom channel reaches defined in the Regional Board's Waste Discharge Requirement Permit for Los Angeles River Watershed. These hydraulic models will be used to determine whether or not the channel reaches currently have adequate flood control capacity.
- B. For reaches identified as currently having adequate flood control capacity, the models will then be used to evaluate what amount of vegetation can be allowed to grow without compromising capacity. This will be done in conjunction with recommendations from the LACFCD's biological consultant.
- C. For reaches not having adequate flood control capacity, the models will then be used to evaluate the removal of vegetation necessary to restore capacity, in conjunction with recommendations from the biological consultant.

#### **4.1.3 Office and Field Investigations**

- A. As-built and other plans, including those for channels, structures, bridges, and utilities, along with topographic mapping, and field surveys within the study area, shall be collected and reviewed to determine existing channel configuration and conditions.
- B. For locations where as-built and other plan data are not available, LACFCD shall research, collect, organize, and review all readily available spatial data.
- C. Field investigations shall be conducted for all 26 soft-bottom reaches of the Los Angeles River Watershed to verify channel geometry, stability, and roughness values. The field investigations shall occur between mid-July and mid-August when channel reaches are expected to contain the maximum amount of vegetation re-growth, prior to annual vegetation removal during fall maintenance activities. The existing vegetation shall be observed taking note of type, density, and size. All the reaches shall be photographed for documentation purposes.
- D. LACFCD shall research, collect, organize, and review all readily available hydrologic studies as well as other documentation pertaining to the 26 soft-bottom reaches of the Los Angeles River Watershed.

#### 4.1.4 Hydraulic Analysis Modeling

- A. LACFCD shall prepare one-dimensional steady-flow hydraulic models for all the project reaches using HEC-RAS
- B. The cross section locations and intervals will be coordinated to ensure consistency and to make certain the channel and project areas are completely and adequately represented in the models
- C. Hydraulic roughness coefficients for all project reaches shall be determined using field notes, aerial photographs, and several hydraulic references. The hydraulic roughness coefficients shall be representative of current observed field conditions and correlated with biological consultant's vegetation transect survey data
- D. Some of the hydraulic references that shall be used to determine the hydraulic roughness coefficients include "*Open-Channel Hydraulics*" by Ven T. Chow and "*Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains*," United States Geological Survey Water-supply Paper 2339
- E. The general modeling guidelines for bridges shall be followed closely. For vertical piers, 2 feet of debris accumulation on each side of each pier shall be used and loss coefficients and other data shall be adjusted accordingly. For piers with sloping extensions, 2 feet of debris accumulation for a distance up to 6 feet below the water surface shall be assumed
- F. LACFCD shall perform the steady flow computations using HEC-RAS for the design flow rates for each project reach
- G. The limits for data collection upstream and downstream of the study reach shall be at a distance such that any user-defined boundary condition will not affect the results within the study reach.
- H. LACFCD shall run the hydraulic analyses under a mixed flow regime. Manning's equation shall be used to compute normal depth as the starting water surface boundary condition. A sensitivity analysis shall be performed by selecting other starting water surface boundary conditions to ensure that the limits for data collection upstream and downstream of the study reach are sufficient.
- I. LACFCD shall include discussion of changes in expected stream flow in response to requirements of the Los Angeles County

Municipal Separate Storm Sewer (MS4) NPDES Permit, Standard Urban Stormwater Mitigation Plans (SUSMPs), Total Maximum Daily Loads (TMDLs) and other pertinent local plans including, but not limited to, the Integrated Regional Water Management Plan (IRWMP) (including implementation of, and plans for, increased stormwater infiltration), the City of Los Angeles' Integrated Resources Plan, the relevant Watershed Master Plan, and the LACFCD's Drought Management Plan

- J The roughness coefficient is an important parameter in hydraulic analysis of flood control channels. Vegetation, depending on the type, size, density, and distribution has an important effect on the roughness coefficient. The vegetation effect will be considered in determining the roughness coefficient in this study work plan. Flood control channels are designed for extreme events, such as 100-year storm events. There is a one-percent chance for such an event to occur in any given year. The volume of runoff will not be a factor in hydraulic analysis of flood control channels. Since the mentioned policies are intended to mitigate for less severe and more frequent stormwater runoff events (for example, 3/4 inches of rainfall), the impacts of the watershed as a result of these policies have negligible bearings on flood control design capacity standards that are based on much larger runoff events (for example, 6 to 10 inches of rainfall)
  
- K LACFCD shall perform separate hydraulic analyses of the project reaches having adequate flood control capacity using several reasonable hydraulic roughness coefficients in potential areas where vegetation may remain and areas with the potential for restoration of native vegetation. Identification and location of these potential areas shall be discussed. Vegetation type, density, and height are factors necessary to determine appropriate hydraulic roughness coefficients.
  
- L Conversely, LACFCD shall perform separate hydraulic analyses of the project reaches not having adequate flood control capacity using several reasonable hydraulic roughness coefficients in potential areas where vegetation may need to be removed. Identification and location of these potential areas shall be discussed with a biological consultant. Vegetation type, density, and height are factors necessary to determine appropriate hydraulic roughness coefficients.

#### **4.1.5 Hydraulic Analysis Report**

LACFCD shall prepare a Hydraulic Analysis Report that documents and summarizes all of the data collected and processed. The Hydraulic Analysis Report shall include a written narrative that describes the hydraulic characteristics of the project study areas. The report shall also contain sufficient detail in terms of tables, equations, graphic displays, and example computations to allow an independent assessment of the soundness of the report results and conclusions.

### **4.2 Biological Technical Assessment**

The biological studies described in this Workplan will be conducted at each of the 26 channel reaches.

#### **4.2.1 Literature Review**

A literature review will be conducted to review and update existing information gathered through the soft-bottom channel maintenance program about species that have been afforded special status by State, Federal, and local resource agencies and organizations and have a potential to occur within the Los Angeles River Watershed.

Sources to be reviewed include

- A. Special status species lists from CDFG, U S Fish and Wildlife Service (USFWS), and California Native Plant Society (CNPS),
- B. Database searches of the California Natural Diversity Database (CNDDDB) and the Electronic Inventory of the CNPS,
- C. Most recent Federal Register listing package and critical habitat determination for each federally listed endangered or threatened species potentially occurring within the project sites,
- D. CDFG's Annual Report on the status of California's listed threatened and endangered plants and wildlife,
- E. The California Rapid Assessment Method (CRAM) will be used in preparation of the Biological Technical Assessment to evaluate the condition of the 26 channel reaches. The CRAM uses field indicators to assess the condition of wetlands and identify stressors that affect the ecological health of the system. The benefit of CRAM is that it is a standardized process of evaluation that will allow the condition of these channels to be compared to others in the region and will facilitate future monitoring to evaluate changes in the condition of the channels over time. The survey results will be downloaded to the statewide CRAM database for

data storage and sharing. All data collection and data management will be performed in strict accordance with the protocols described in the CRAM User's Manual; and

- F Other biological studies conducted in the Los Angeles River Watershed that may be relevant to this feasibility study

#### **4.2.2 Field Surveys**

Field surveys will be conducted by a qualified botanist and wildlife biologist to identify the plant and wildlife species present at each channel reach maintained by LACFCD in the Los Angeles River Watershed. The vegetation types and wildlife habitats will be described, mapped, and quantified.

The surveys are expected to be conducted during the summer season when the majority of plant species present at the channel reaches will be identifiable. Because most migratory birds will have moved through the region, only the breeding birds should be present during the survey. A vegetation map will be produced and included with the final report. Photographs of existing conditions will also be obtained.

These surveys will be conducted prior to initiation of the annual LACFCD fall season maintenance activities.

In response to the Stakeholder's request, two surveys at Compton Creek during fall migration will be conducted and a "reference riparian location" will be conducted at Wilmington Drain. Migratory bird use of the selected channel reaches could be demonstrated by performing a survey before and after fall maintenance activities. These surveys will be incorporated into the Workplan for the Feasibility Study.

It should be noted that the purpose of the summer avian surveys is to show the value of the vegetation for birds prior to its removal in the fall. The purpose of these surveys is not to "determine impacts to all avian species" because this is not a proposed project but an existing maintenance program within flood control channels that has occurred for decades. The LACFCD's annual biological monitoring, during fall during pre- and post-clearing maintenance activities and during spring focused wildlife surveys, have shown that a wide range of migratory birds use the flood control channels. Depending on the habitats present, and especially if surface water is present, the channel reaches provide resources for a wide variety of migratory birds before and after clearing activities.

### **4.2.3 Vegetation Transect Data Collection**

Two sets of vegetation transect data will be collected for each of the 26 channel reaches maintained by the LACFCD in the Los Angeles River Watershed. Transect data will provide percent cover of vegetation relative to unvegetated areas of the channel reaches for comparison between and within the channel reaches. The transect data will also include comparison of native and non-native vegetation types, and will generate relative abundance data for individual plant species. See Attachments 2 and 3 for sample copies of a Stream Channel transect and a completed comparison of Species Composition and Coverage data sheet. Attachment 4 is a sample form used by biologists during the Transect Data collection survey.

The first set of transects will be performed during the summer season prior to initiation of the annual fall maintenance activities conducted by the LACFCD.

The second transect set will be conducted as soon as possible after completion of fall maintenance activities. Transect number and location will be correlated with the hydraulic roughness coefficients values developed by the LACFCD's hydraulic analysis. This information will provide a biological basis for these values.

Performance of the first set of transects is scheduled to be completed in August, following LACFCD's field surveys that are expected to occur between mid-July and mid-August.

Note that these surveys and transects are scheduled to occur during the time period when the channel reaches are expected to contain the maximum amount of vegetation re-growth prior to its removal during fall maintenance activities.

The total number of reach "segments" identified with individual hydraulic roughness coefficients will determine the total number of vegetation transects to be conducted for this task. Each transect will be conducted to measure vegetation cover and species diversity using the line-intercept method.

Global Positioning System data points will be collected for each of the transect locations. Transects will be conducted perpendicular to the stream ("bank to bank") and will be of varying width. Transect locations will include "maintained areas" of the channel reach in order to provide comparison between pre-clearing maintenance activities and post-clearing activities.

#### **4.2.4 Focused Surveys for Special Status Plant Species**

Focused Surveys for Special Status Plant Species will be conducted for each of the 26 channel reaches in the Los Angeles River Watershed. These surveys will be conducted during the blooming periods for each of the plants, which vary depending on rainfall and temperature. Therefore, reference populations will be monitored to determine the appropriate survey time (generally between March and July). See attachment for a sample copy of the data collection forms.

Since blooming periods for special status plant species typically overlap, surveys of the 26 channel reaches in early spring and again in late spring can be conducted to cover most of the desired species. A total of nine surveys are required to cover all 26 channel reaches. There are a few species that bloom in late summer or fall, however, and may not be detected during spring surveys.

Since only a few of the 26 channel reaches in the Los Angeles River Watershed are expected to support suitable habitat for these late summer or fall special status plant species, two surveys will be conducted at less than 10 channel reaches during this time period (August through October).

The focused surveys will be conducted using meandering transects throughout potential habitat of each channel reach. Field notes will be taken during the surveys. If any special status plant species are found, the location of each population will be mapped and voucher specimens will be collected and deposited in an appropriate herbarium to ensure the accuracy of the identification.

Any special status species observed will be reported to the California Natural Diversity Data Base (CNDDB).

#### **4.2.5 Focused Surveys for Threatened and Endangered Wildlife Species**

Focused surveys for threatened and endangered wildlife species are conducted bi-annually for the soft-bottom channel maintenance program. These surveys were initiated in 2002 and 2003 at channel reaches selected by the U.S. Fish and Wildlife Service for their potential to support threatened and endangered wildlife species.

Of the 26 channel reaches included in the feasibility study for the Los Angeles River Watershed, focused surveys were conducted in 2009 at channel reaches #12 (Haines Canyon Main Channel Outlet) and #14 (May Channel Outlet). These reaches and previous focused survey results for the remainder of the 26 channel reaches will be included in the biological technical assessment.

#### **4.2.6 Biological Technical Assessment Report**

After collection of all pre- and post-clearing vegetation transects data, a biological technical assessment report will be prepared that documents plant and wildlife species observed at each of the 26 channel reaches in the Los Angeles Watershed

The Biological Technical Report will include

- A. Methodology used to conduct the biological surveys and vegetation transects,
- B. Description of the existing vegetation types and associated wildlife resources, including maps of existing vegetation types for each of the 26 channel reaches,
- C. Results of focused surveys for special status plant and wildlife species in the channel reaches,
- D. Comparison of biological functions and values between each of the 26 channel reaches,
- E. Comparison of vegetation transects with WDR's hydraulic roughness coefficients,
- F. Value rankings based on biological function and value for each of the 26 channel reaches, and
- G. Amount(s) and type(s) of native vegetation that could remain in each channel reach without adversely affecting needed hydraulic capacity

#### **4.2.7 Recommendations**

All biological surveys identified in the Workplan for the Feasibility Study will follow accepted survey protocols of the California Department of Fish and Game or use other methods that are scientifically defensible

The value rankings for the 26 channel reaches will be developed through CRAM and will also be scientifically defensible. The value rankings developed for each of the 26 channel reaches in the biological technical assessment will be correlated with the hydraulic analysis to develop recommendations regarding where and what vegetation should be removed and/or can be allowed to remain. The value rankings will also include suggested schedules of vegetation removal frequency in order to ensure maximum habitat preservation is achieved, consistent with the necessary level of flood control

If the hydraulic analysis determines that any of the 26 channel reaches can support more substantial vegetation, then value rankings in the biological technical assessment can be used to identify appropriate areas for re-establishment of additional native vegetation

#### **4.3 Water Quality Monitoring and Best Management Practices (BMP) Plan**

The Feasibility Study requires Water Quality (WQ) Monitoring and BMP activities to be analyzed

Condition 43, Best Management Practices, states

“All appropriate Best Management Practices (BMPs) shall be implemented in order to avoid impacts to water quality that would result in exceedances of water quality standards. The Project shall not result in indirect impacts to water quality or beneficial uses of downstream water bodies. The Project shall not result in changes in the quality of storm water downstream water bodies during maintenance or during operation subsequent to the maintenance activities. The Project shall not result in changes in the quality of storm water discharge during periods between maintenance activities, or upon its completion.”

Condition 49, Water Quality Monitoring, states

“The objectives of the water quality monitoring are to assess BMP effectiveness and to ensure that water quality is not impacted as a result of the proposed maintenance activities, or surface water diversion. BMPs are to be implemented in association with maintenance activities to avoid impacts to water quality which would result in exceedances of water quality standards

As part of the Feasibility Study, water quality assessments within each reach will be required on a one-time basis before, during, and after maintenance clearing activities. Each project reach will require three (3) sampling stations upstream of the project; within the project, and downstream of the project

The testing parameters required will be the same as for Surface Water Diversion.

- pH
- temperature
- dissolved oxygen
- turbidity
- total suspended solids (TSS)

Downstream TSS shall be maintained at ambient levels. Where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), downstream increases shall not exceed 20%. Where natural turbidity is greater than 50 NTU, downstream increases shall not exceed 10%.

Analyses must be performed using approved U.S. Environmental Protection Agency methods, where applicable.

These constituents shall be measured at least once prior to the maintenance activity and then monitored on a daily basis during the first week of maintenance activities, and then on a weekly basis, thereafter, until the work is complete. When reaches are within the watershed designated for a Feasibility Study in a particular year, water quality monitoring should be conducted for those reaches as part of the Feasibility Study and reported with the Technical Assessment Report.”

The LACFCD will address the planning and implementation of the Water Quality monitoring aspect of the Feasibility Study as well as handle and address issues relating to BMPs.

The following is a step-by-step process by which LACFCD will implement the Water Quality monitoring. Attachment 5 is a copy of a Field Data sheet to be used for recording Water Quality measurements and taking water samples. Attachment 6 is the Chain-of-Custody form that will be used to submit water samples to the Contract Environmental Lab. Attachment 7 is a sample copy of a completed Water Quality Sampling Monitoring Test and Lab result performed at Kagel Canyon Channel, one of the reaches within the Los Angeles River watershed.

#### **4.3.1 Pre-Project Monitoring**

- A. Pre-Project Monitoring to establish natural channel conditions
  - 1. Field Reconnaissance/Cleanout operations/approach/methods
  - 2. Scope of project; Location and type of BMPs
  - 3. Estimated duration
  - 4. WQ monitoring parameters
- B Define upstream (U), within project (W) and downstream (D) sampling points
- C Initiate measurements and record Water Quality data at U/W/D sampling points
  - 1. Field measurements
    - PH
    - Temperature (T)
    - Turbidity
  - 2. Lab samples
    - Dissolved O<sub>2</sub>, Standard Method (SM) 4500-OG
    - Total Suspended Solids, SM 2540/EPA 160.2
    - Deliver samples to lab
  - 3. Lab results
    - Normal turn-around-time = 5 days

#### **4.3.2 Project Monitoring**

- A For the first week, water sampling will be taken once a day
- B For subsequent weeks, water sampling will be taken once a week
- C Check in with Crew Leader, Foreman, etc
  - 1. Discuss changes in scope/duration
  - 2. Discuss Water Quality measurements
- D Water Quality monitoring/sampling at U/W/D sampling points
  - 1. Field measurements
  - 2. Lab samples
  - 3. Outside influences on Water Quality

- E. E-mail notification to the Project Coordinator and/or Field Office Supervisor if the turbidity measurements exceed WDR limits

#### **4.3.3 Post Project Monitoring**

- A. Finalize field data sheets
- B. Prepare figures of U/W/D sampling points
- C. Receive lab reports
- D. Final data to include field data sheets, figures, and lab reports
- E. Submit final data within 30 days from the final sampling date for submittal to the Regional Board

#### **4.3.4 Best Management Practices Plan**

The BMP Plan will determine which BMPs to implement within each reach to avoid indirect impacts to Water Quality or beneficial uses during maintenance or operation, or that would result in exceedances of Water Quality standards. The BMP Plan shall include the following

- A. Continued implementation of approved BMPs appropriately selected for each channel reach based on the field condition, the type of maintenance work, and the type of equipment (mechanical or hand tools) necessary in completing the maintenance activity

The BMPs, listed in the current Soft-Bottom Channel's Monitoring Form prepared for each individual channel reach, were based on the LACFCD's "Best Management Practices Manual for Soft-Bottom Channels". The BMP Manual (see Attachment 8) was previously prepared for and was approved by the Regional Board as part of the expired 401 Certification

- B. If Water Quality test results for a particular reach indicate that BMPs being implemented are not working or may need additional BMPs, the LACFCD will modify existing BMPs with alternative and/or additional BMPs
- C. LACFCD engineers, field, and Water Quality staff have been working together to research and test available BMPs from outside consultants and companies. Some alternative BMPs were actually used in past maintenance activities and were documented in the Monitoring Forms. LACFCD will continue to use and implement alternative BMPs that were found to be effective and efficient, as necessary

#### **4.3.5 Water Quality Data Analysis Submittal**

Provide a complete summary of Water Quality testing results, in tabular format, for each reach. Tables will provide data collected from before, during, and after the cleanout for the three (3) sampling stations located upstream of the project, within the project, and downstream of the project. Comments will also be provided including, but not necessarily limited to, observed site conditions, BMPs installed on site, recommended modifications to BMPs, communications with field staff, and explanations for changes to previous conditions and measurements.

### **4.4 Stakeholder Solicitation**

The WDR requires the LACFCD to solicit stakeholder input and to make information on maintenance activities for soft-bottom channel reaches readily available to the public. The list of stakeholders will include affected and interested parties, municipalities, environmental groups, and organizations.

#### **4.4.1 Objective**

Solicit stakeholder input, during the development of the Workplan and prior to the finalization of the Technical Assessment Report and Recommendations. In addition, prior to any maintenance activities within the affected reaches of the Los Angeles River Watershed, watershed maps that specify areas of maintenance and approximate schedule shall be published on the LACFCD internet website. Stakeholders and other affected/interested parties shall be notified of these activities. After submission to the Regional Board Executive Officer, LACFCD shall post the Annual Project and Mitigation Monitoring Reports on the LACFCD internet website.

#### **4.4.2 Stakeholder Identification**

LACFCD shall identify watershed stakeholders in conjunction with the Regional Board to solicit comments from the parties interested in the WDR.

#### **4.4.3 Soliciting Stakeholder Input**

LACFCD shall notify the stakeholders via e-mail of the significance of the WDR and availability of the Workplan for review. This notification will state the deadline for receipt of comments and will also mention the Technical Assessment Report and Recommendations that will be available for their review and comment in the near future.

Upon receiving the comments, the LACFCD shall organize and incorporate the comments into the Work Plan, as appropriate

#### **4.4.4 Technical Assessment Report and Recommendations**

Upon finalizing the Technical Assessment Report and Recommendations, LACFCD shall notify the stakeholders of the availability of the report and recommendations for their review and comment. LACFCD shall organize and incorporate the comments, as appropriate, into the final Technical Assessment Report and Recommendations

#### **4.4.5 Information Access on LACFCD Internet Website**

Prior to any maintenance activities within the affected reaches of the Los Angeles River Watershed, watershed maps shall be published on the LACFCD internet website. Stakeholders and other affected/interested parties shall be notified of the scheduled maintenance activities. The information posted for scheduled maintenance activities shall include, but not be limited to, the proposed schedule, description of the channel reach existing conditions, area of proposed impact; and description of any existing aquatic resources. The Annual Project and Mitigation Monitoring Reports shall also be posted on the LACFCD internet website

#### **4.4.6 LACFCD Internet Website for Soft-Bottom Channel Maintenance**

The LACFCD internet website will house the watershed maps, scheduled maintenance activities, Annual Project Report, and Mitigation Monitoring Report. LACFCD shall also notify the stakeholders of this website for their reference and use. LACFCD update the watershed maps and the Annual Project and Mitigation Monitoring Reports approximately once a year and the scheduled maintenance activities approximately once a week, during appropriate times of the year

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