Working Group Meeting #1

WASTE DISCHARGE REQUIREMENTS
WDR (ORDER NO. R4-2015-0032)

Maintenance Clearing of Engineered
Soft-Bottom Flood Control Channels

Purpose of Meeting

- On Feb 12, 2015, LACFCD requested a new 5-year term WDR permit from the Water Board for the maintenance of Soft-Bottom Channel Reaches 1-110.
- Water Board
  - Approved a 1-year extension
  - Instructed LARWQCB and LACFCD to seek input from stakeholders.
  - Topics of Working Group Meetings will include flood protection, vegetation, and habitat management.

WDR Purpose

1. Vegetation clearing of Soft-bottom channels to maintain channel capacity and provide for flood control

2. WDR ensures water quality protection during channel vegetation clearing activities

3. WDR requires LACFCD to evaluate and determine if
   - A potential may exist for native vegetation to remain within soft-bottom portion of the channel, or
   - If additional hydraulic capacity is needed

4. Public Outreach

LACFCD

- The LACFCD was established in 1915 under the Los Angeles County Flood Control Act.
- Its boundaries encompass approximately 2,752 square miles.
- **LACFCD's mission is to:**
  - Construct, operate, and maintain an advanced system for flood protection
  - Conserve water
  - Preserve, enhance, and maintain recreational features located on LACFCD Right of Way

Vegetation Maintenance

Vegetation clearing is required on Soft Bottom Channels and Levees

1. To provide flood protection for County residents
2. To comply with USACE Operations & Maintenance Manual
3. To comply with USACE Levee Safety Program
4. To comply with FEMA Levee Certification Program

Flood Protection

CHANNEL CAPACITY IS A FUNCTION OF:

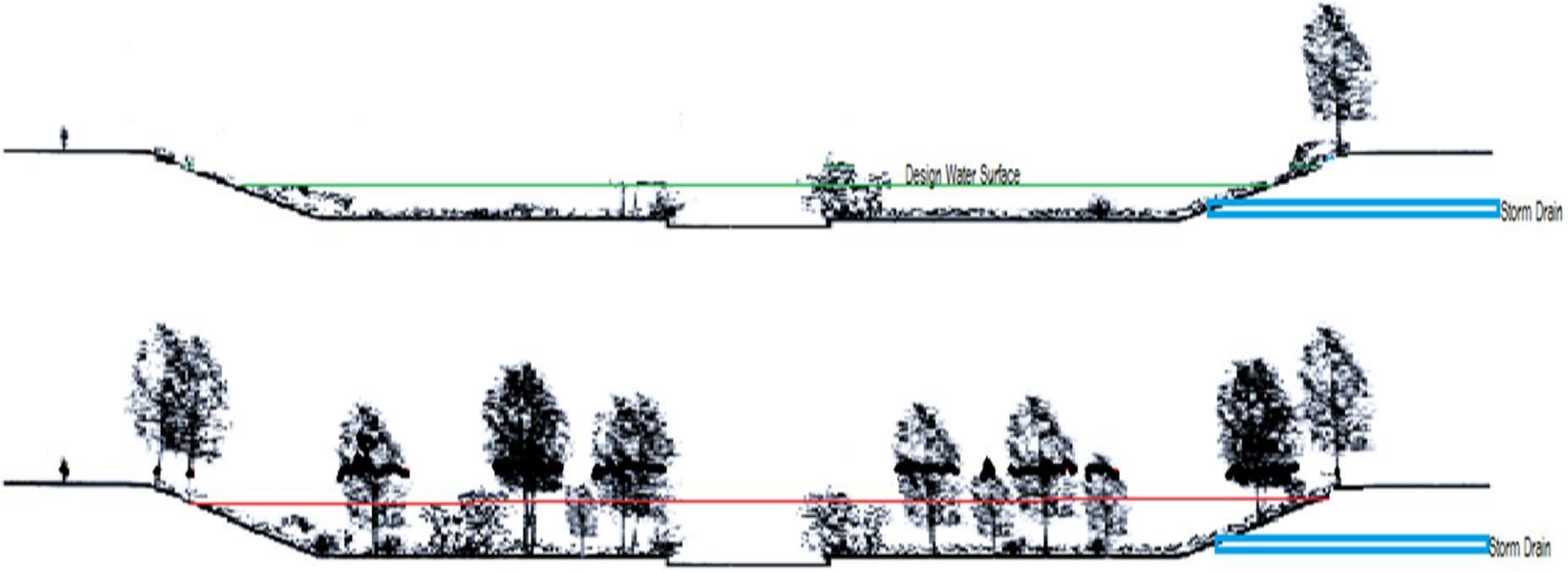
- Cross-section (Channel geometry)
- Roughness of the Channel
- Grade (Channel slope)

FACTORS AFFECTING ROUGHNESS

- Type and size of vegetation
- Channel bed material
- Obstructions
- Surface irregularities
- Variations in shape and size of cross-section
- Channel meandering
- Depth of flow

Flood Protection

Effects of Vegetation



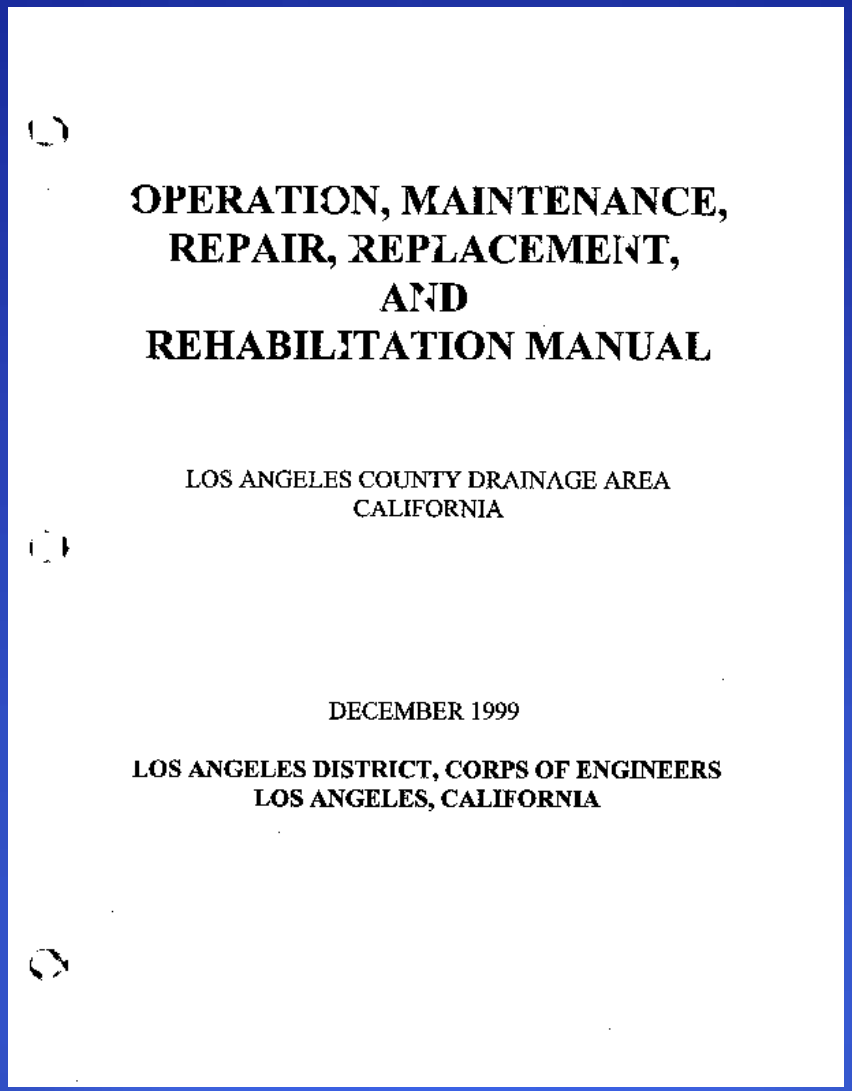
Green Line = Channel with some vegetation

Water Surface Elevation = 50 ft.

Red Line = Channel with more vegetation

Water Surface Elevation = 55 ft.

USACE Operations & Maintenance Manual



OPERATION, MAINTENANCE,
REPAIR, REPLACEMENT,
AND
REHABILITATION MANUAL

LOS ANGELES COUNTY DRAINAGE AREA
CALIFORNIA

DECEMBER 1999

LOS ANGELES DISTRICT, CORPS OF ENGINEERS
LOS ANGELES, CALIFORNIA

USACE Operations & Maintenance Manual

- LACFCD has an approved O & M Manual for channels and levees transferred from USACE. Some provisions of this manual include:
  - The principal purpose of the system is the conveyance of storm water-runoff
  - Generally free of vegetation and debris
  - No improvement, excavation, or construction that may impact the structural integrity and channel capacity (such as causing a change to the water surface profile) is permitted

USACE Levee Safety Program

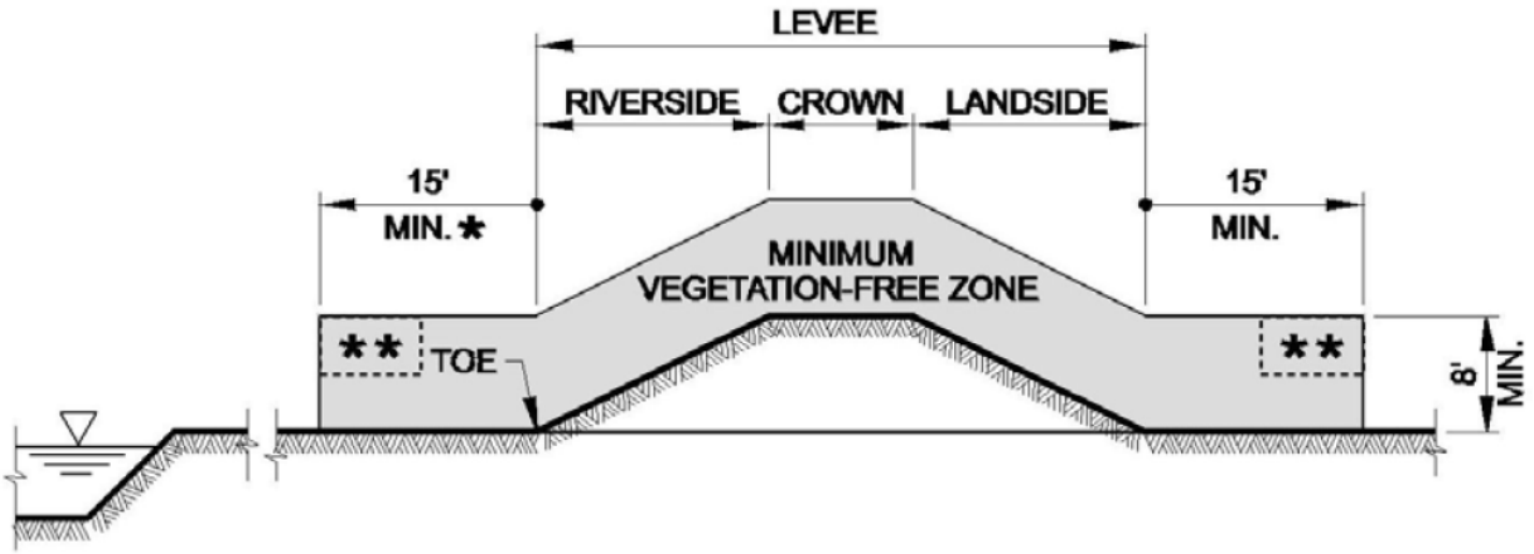
- Public Law 84-99 gives authority to USACE to inspect levees under the Rehabilitation and Inspection Program (RIP)
- Acceptable Operation & Maintenance by levee owner are verified through levee inspections by the USACE
- Levees under RIP get federal funding in case they are damaged and are in need of repair
- Levees that are not in compliance with the requirements of PL 84-99 are removed from the program
  - No federal funding is available for repairs

USACE Levee Safety Program

Some of the items inspected by USACE during inspection include:

- Embankment stability
- Embankment & foundation seepage / piping
- Embankment erosion
- Closure systems
- Vegetation

USACE Levee Safety Program



* 15' OR DISTANCE TO EDGE OF NORMAL WATER SURFACE, IF LESS

** IN THIS 4' X 7' TRANSITION ZONE, TEMPORARY OBSTRUCTION BY LIMBS AND CROWN IS ALLOWED DURING DEVELOPMENT OF NEW PLANTINGS, FOR UP TO 10 YEARS

▽ NORMAL WATER SURFACE

USACE Levee Safety Program

USACE Levee Inspection Methodology

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
Unwanted Vegetation Growth	**«LER1»**	**A**	The levee has little or no unwanted vegetation (trees, bush, or undesirable weeds), except for vegetation that is properly contained and/or situated on overbuilt sections, such that the mandatory 3-foot root-free zone is preserved around the levee profile. The levee has been recently mowed. The vegetation-free zone extends 15 feet from both the landside and riverside toes of the levee to the centerline of the tree. If the levee access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits.	«LEC1»
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the levee.	
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above and must to be removed to reestablish or ascertain levee integrity.	

USACE Levee Safety Program

- The original levee structure was not designed to have trees and shrubs growing on it
- No vegetation is allowed in the vegetation free-zone except for grass
  - Grass provides for erosion control
- Trees and shrubs on levees physically get in the way of equipment for conducting inspection, maintenance and repairs
- Vegetation will provide burrowing animals with cover
  - Burrowing rodents could weaken levee integrity by excavating network of tunnels and cavities
- Tunnels and cavities cause:
  - Seepage
  - Embankment erosion

USACE Levee Safety Program

- Tree roots cause piping are potential sources for seepage
- Overturned (up-rooted) trees may damage levee embankments

USACE Levee Safety Program

Inspection for Vegetation Growth

2012 Army Corps Periodic Inspection Results - Unacceptable

LAR/CC1 Levee System Deficiencies - Unwanted Vegetation Growth/ Vegetation Obstructions

Reach Limits: Artesia Freeway (State Route 91) TG 735-A7 to Pacific Ocean TG 825-C1

USACE Comments

	Inspection ID	Station	Coordinates	Category	Rated Item	Remarks	Action Needed
1	USACE_CESPL_LC1C_2010_a_0191	080+42 -	-118.20511, 33.84207;	Levee Embankments	1. Unwanted Vegetation Growth	Large trees on ls slope.	Remove trees.
2	USACE_CESPL_LC1C_2010_a_0212	080+52 -	-118.20499, 33.84226;	Levee Embankments	1. Unwanted Vegetation Growth	Significant vegetation at the toe of rs slope.	Remove vegetation.
3	USACE_CESPL_LC1C_2010_a_0252	155+92 -	-118.21597, 33.86068;	Levee Embankments	1. Unwanted Vegetation Growth	Heavy veg at the bottom of channel.	Remove vegetation.
4	USACE_CESPL_LC1C_2010_a_0273	194+08 -	-118.21614, 33.8711;	Levee Embankments	1. Unwanted Vegetation Growth	Dense vegetation on rs slope.	Remove vegetation.
5	USACE_CESPL_LC1C_2010_a_0360	077+74 - 084+92	-118.20442, 33.84163; 118.20602, 33.8431	Floodwalls	1. Unwanted Vegetation Growth	Significant vegetation on top of FW.	Remove vegetation.
6	USACE_CESPL_LC1C_2010_a_0365	086+95 - 101+35	-118.20663, 33.84334; 118.20952, 33.84658	Levee Embankments	1. Unwanted Vegetation Growth	Large treest growing at the ls toe of the levee.	Remove vegetation.
7	USACE_CESPL_LC1C_2010_a_0370	101+10	-118.2095, 33.84649	Levee Embankments	1. Unwanted Vegetation Growth	Large trees growing on the ls slope.	Remove trees.
8	USACE_CESPL_LC1C_2010_a_0372	112+12 - 153+54	-118.21132, 33.84918; 118.21592, 33.85994	Levee Embankments	1. Unwanted Vegetation Growth	Large trees growing on the ls edge of the crown.	Remove trees.
9	USACE_CESPL_LC1C_2010_a_0386	196+35	-118.21629, 33.87155	Levee Embankments	1. Unwanted Vegetation Growth	Large tree on the ls edge of the crown.	Remove tree.

Area	Channel Name	Major Deficiencies
South Area	*Los Angeles River - Compton Creek 1*	*FG, V, E, RR, R, VO, EB, CS, B, D, C, CDP, TR, MJ, SSG, CR, ME, PM, P*

NOTE: Major Deficiencies start from most severe to less severe.

Ratings: U: Unacceptable

Acronyms

B:Burrows/Animal Control	MJ: Monolith Joints
C:Cracking	P: Pumps
CDP: Culverts/ Discharge Pipes	PM: Pump Stations Operating,Maintenance, Training, & Inspection Records
CR: Cranes	RR: Riprap Revetments & Bank Protection
CS: Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)	R: Revetments other than Riprap
D: Depressions/Rutting	SSG:Sluice/Slide Gates
E: Encroachments	TR: Trash Racks (non-mechanical)
EB: Erosion/Bank Caving	V: Unwanted Vegetation
FG: Flap Gates/ Flap Valves/ Pinch Valves	VO: Vegetation and Obstructions
ME:Megger Testing on Pump Motors and Critical Power Cables	

USACE Levee Safety Program

USACE Levee Safety Program

FEMA Levee Certification Program

- This program is part of the National Flood Insurance Program (NFIP)
- The main purpose is to provide protection against a **100-year** flood
- As part of NFIP, FEMA is tasked to revise/upgrade its flood zone maps
- Levee Certification Program analyzes the design and physical condition of the levee

FEMA Levee Certification Program

- Freeboard
- Closure
- Embankment Protection
- Embankment & Foundation Stability
  - Seepage & Penetration analysis
- Settlement
- Interior Drainage

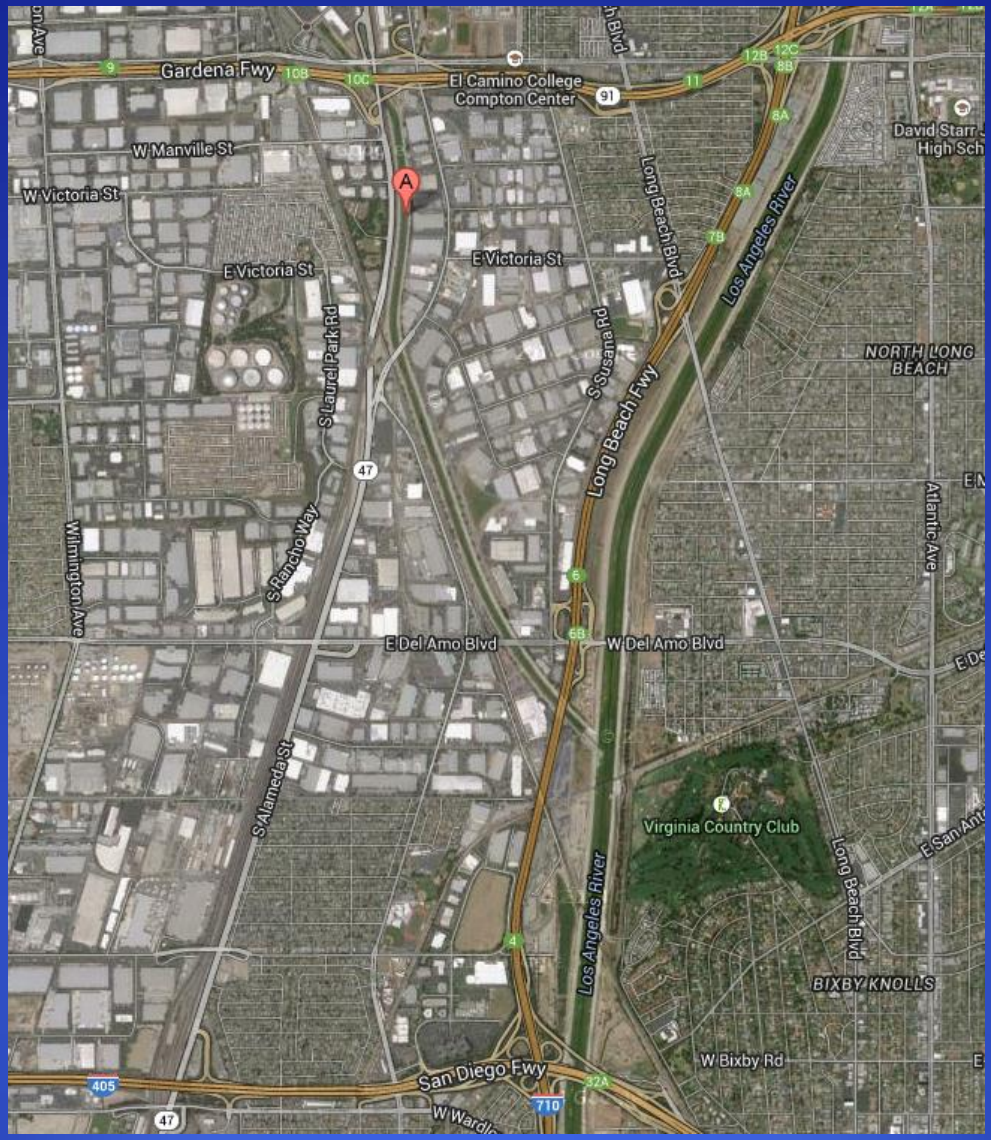
FEMA Levee Certification Program

- It is the responsibility of the levee owner to certify a levee
- The levee must meet the requirements of Chapter 44 of the Code of Federal Regulations, Section 65.10
-
- If FEMA approves the certification analysis it will then accredit the levee
- Properties that are behind levees that have not been accredited by FEMA will be mapped on FEMA's flood zone maps
- Property owners in flood zones must purchase mandatory flood insurance policy

FEMA Levee Certification Program

Compton Creek

FEMA Levee Certification Program



LACFCD'S
CURRENT VEGETATION MAINTENANCE PRACTICES

Vegetation Maintenance Clearing

- LACFCD proposed complete clearing of 100 SBC Reaches in anticipation of the El Nino storm season (1997)
  - A total of 886 acres
    - ~203 acres were vegetated

- LACFCD developed a Maintenance Plan for the Annual clearing (1999) with collaboration with the USACE, CDFW and the Regional Board

- The Maintenance Plan defined the reaches and the clearing methods for each specific reach

Vegetation Maintenance Clearing

- LACFCD was allowed to clear only 48.2 acres of the approximately 203 vegetated acres

- LACFCD mitigated for the removal of 48.2 acres of vegetation with 62.7 acres of mitigation area within the Tujunga Wash Mitigation Bank.

Types of Vegetation Clearing

- Bank-to-Bank vegetation clearing
- Strip-clearing
- Outlet clearing for drainage
- Invasive vegetation clearing
- Vegetation Left In Place

Channel Clearing Bank to Bank

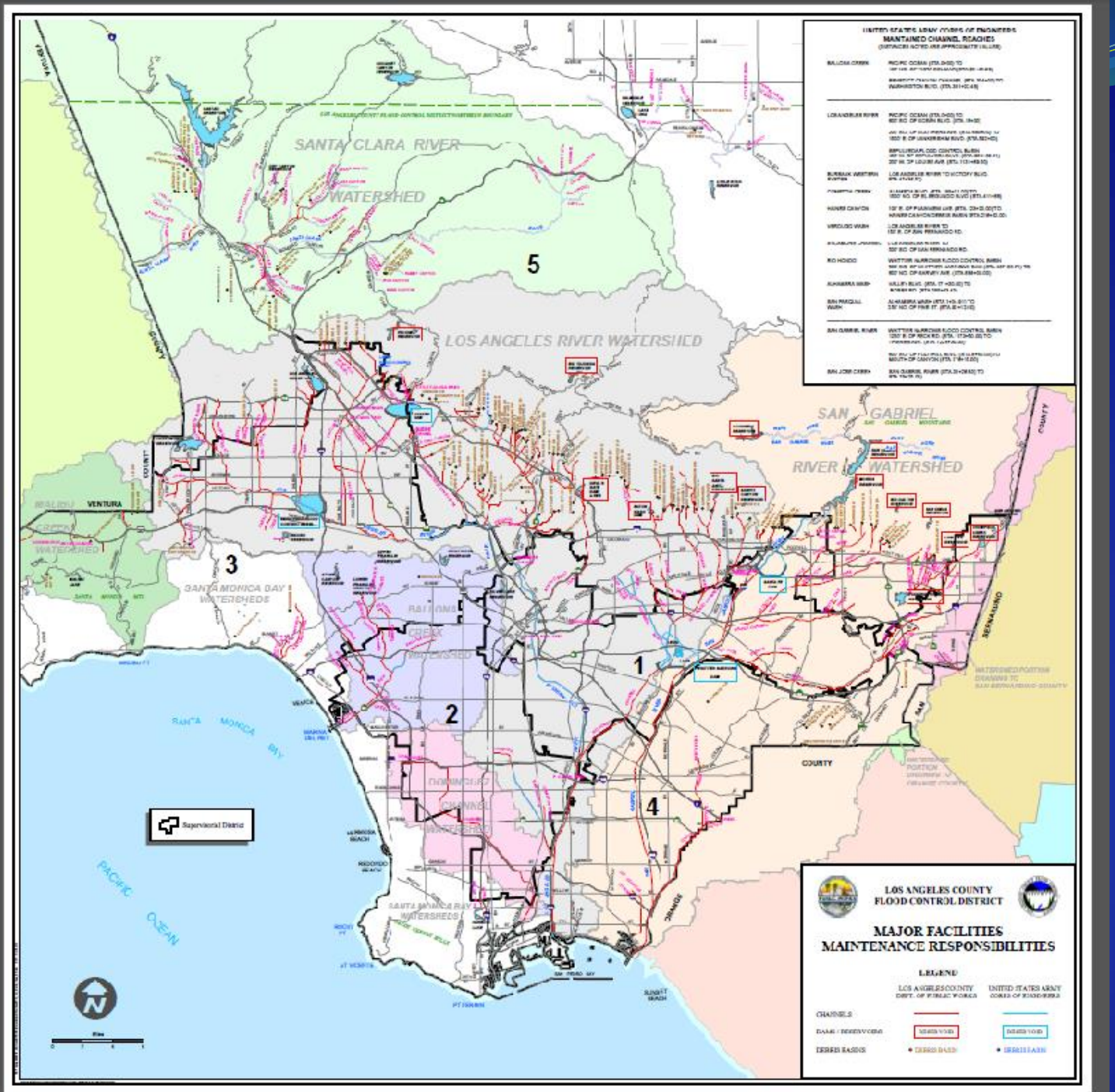
Strip-Clearing

Outlet Clearing for Drainage

Invasive Vegetation Clearing

Vegetation Left In Place

USACE
Maintained Reaches


SANTA CLARA RIVER WATERSHED
LOS ANGELES RIVER WATERSHED
SAN GABRIEL RIVER WATERSHED
SANTA MONICA BAY WATERSHEDS
VENTURA
LOS ANGELES COUNTY
ORANGE COUNTY
SAN BERNARDINO COUNTY
1
2
3
4
5
Supervisorial District
PACIFIC OCEAN
SANTA MONICA BAY
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
MAJOR FACILITIES MAINTENANCE RESPONSIBILITIES
LEGEND
LOS ANGELES COUNTY DEPT. OF PUBLIC WORKS
UNITED STATES ARMY CORPS OF ENGINEERS
CHANNELS
DEBRIS BASINS

QUESTIONS?

NEXT MEETING:

Working Group Meeting #2
Hydraulic Analysis

Thursday, April 16, 2015
(10a.m. – 12 p.m.)

Los Angeles County Dept. of Public Works
Conference Room C