

USACE LEVEE AND DAM SAFETY PROGRAM AND ISSUES

US Army Corps of Engineers, South Pacific Division
Informational Brief prepared by John Moreno, Chief Business
Technical Division

For Western States Water Council
September 29, 2016

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File Name



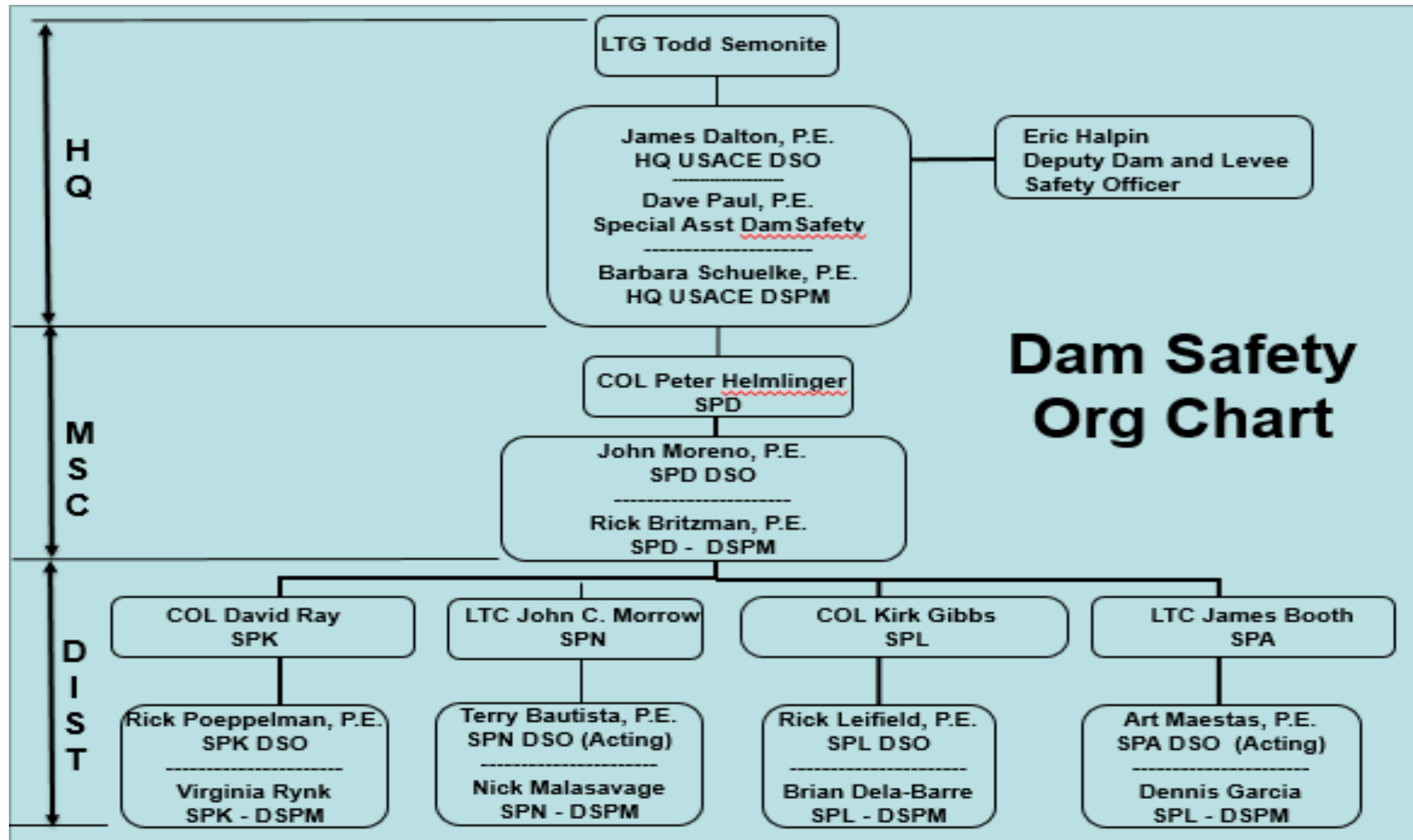
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AGENDA

- USACE Dam Safety Program
- Dam Safety Issue: Water Control Plans and Deviations Process
- Levee Safety Program
- Levee Safety Issue: Vegetation Management Guidelines
- Discussion

USACE DAM SAFETY ORGANIZATIONAL CHART



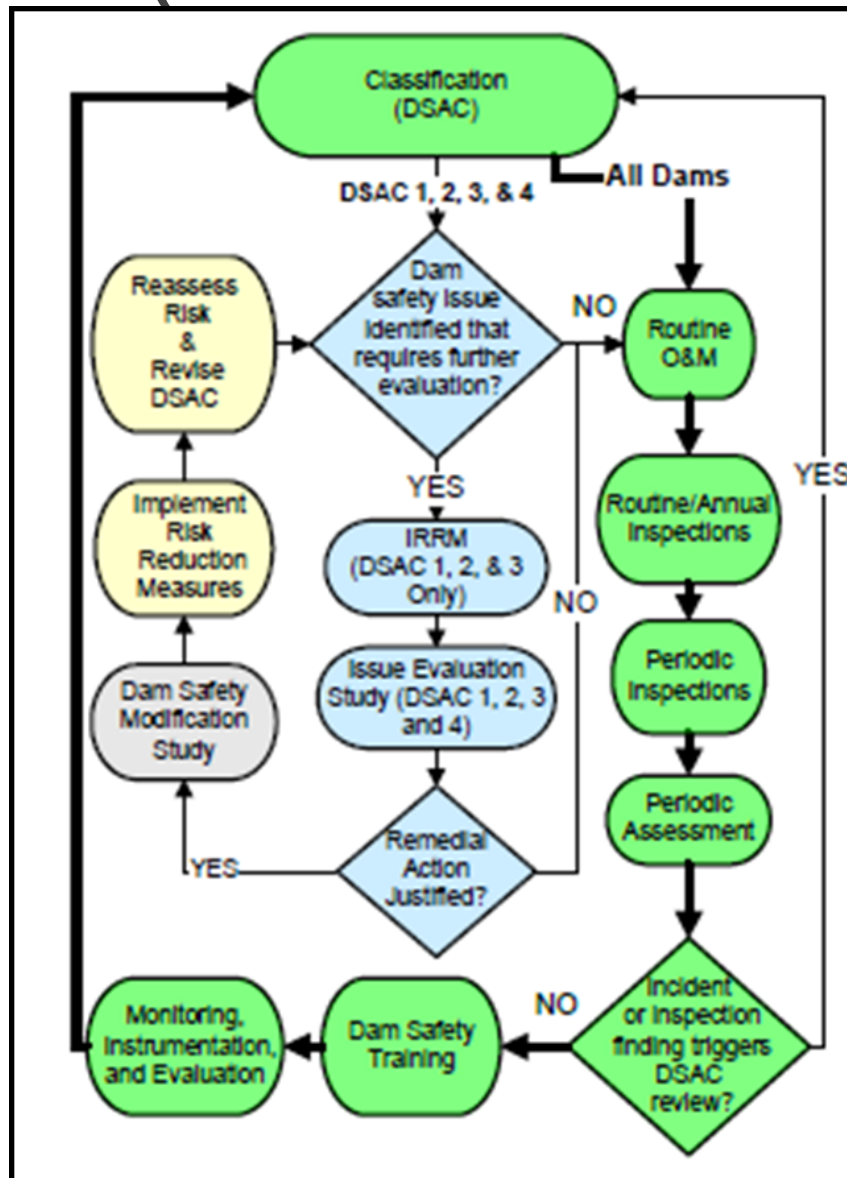
USACE ER 1110-2-1156 SAFETY OF DAMS – POLICIES AND PROCEDURES

- This governing document for USACE can be found at:
 - <http://www.publications.usace.army.mil/USACE-Publications/Engineer-Regulations>
- 14 Guiding Principles with “Public Safety” and “Do No Harm” enumerated as guiding principles 1 and 2.
 - Risk-Informed Corporate Approach
 - Routine Dam Safety Activities

DAM SAFETY ACTION CLASSIFICATION (DSAC) – STATUS OF SPD PORTFOLIO

SPA	SPK	SPL	SPN		Dam Safety Action Class (DSAC)		Characteristics
--	1	1	--		1		Very High Urgency of Action. Critically near failure or Extreme high risk
2	--	1	--		2		High Urgency of Action Failure initiation foreseen or very high risk.
2	6	6	1		3		Moderate Urgency of Action. Significantly inadequate or moderate to high risk.
4	10	6	1		4		Low Urgency of Action Inadequate with low risk.
1	--	--	--		5		Normal Urgency of Action Residual risk considered tolerable
9	17	14	2				

GENERALIZED DAM SAFETY RISK MANAGEMENT PROCESS (ROUTINE AND NON-ROUTINE PROGRAMS)



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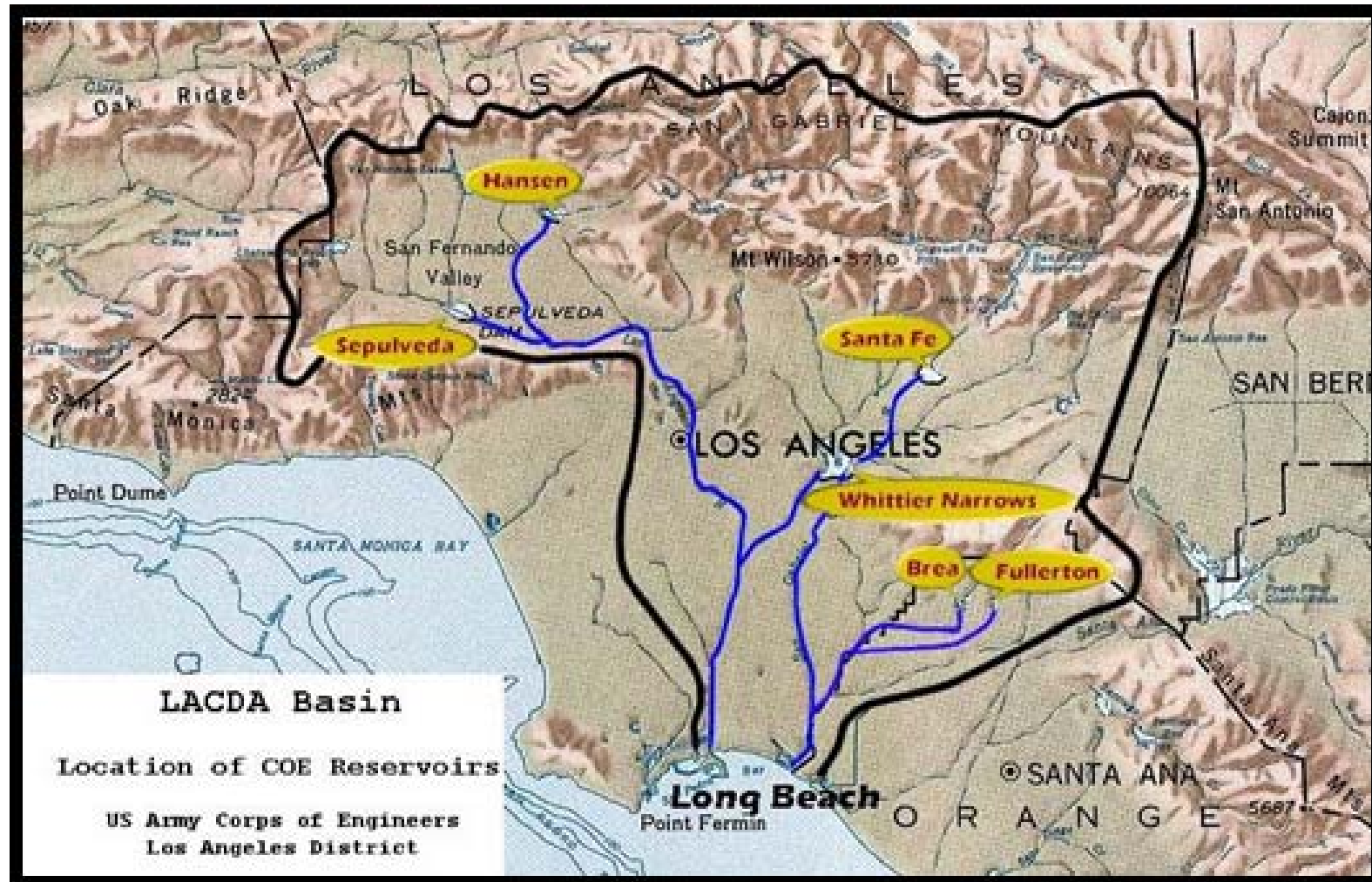
DAM SAFETY ISSUE: DEVIATION TO WATER CONTROL MANUAL ON A DSAC 1 DAM (WHITTIER NARROWS DAM)

7

- Water Control Manual and Plan Principles
- DSAC 1 Dam Considerations:
 - HQUSACE Approval required per ER 1110-2-1156
 - Interim Risk Reduction Measures...pool limits.
 - Water supply and non-flood control purposes.



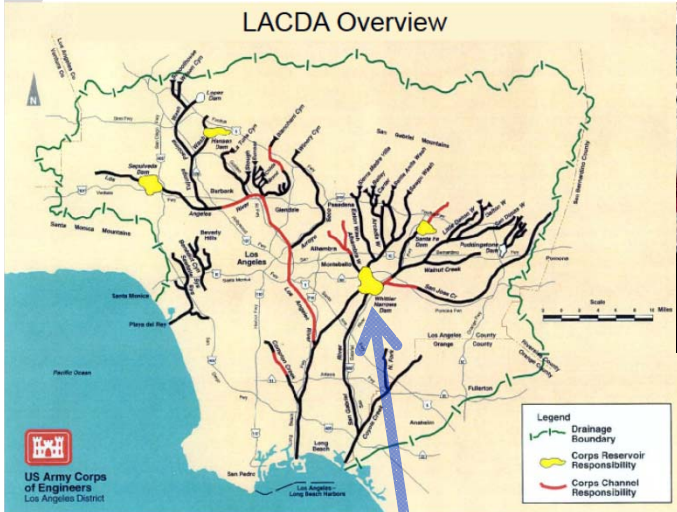
WHITTIER NARROWS DAM



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EXAMPLE: WHITTIER NARROWS DAM



Hub of Los Angeles County Drainage Area System



- Constructed in 1957 for Flood Control purposes
- Rated DSAC-1 high risk due to large population downstream. Dam Safety Modification Study in progress.
- Water Control Plan approved for incidental water conservation in 1978; the operations are closely Coordinated with LACDPW.
- Water Control Plan deviation thru 2016
- Pending Feasibility Study to increase water conservation

Downstream groundwater recharge basins operated by Los Angeles County Department of Public Works



SPD DEVIATION POLICY NO. 10-1-04 TO A WATER CONTROL PLAN/MANUAL

Minor Deviation

- Change of 5% or less in volume of the total storage of the reservoir or 2 feet in elevation (which ever is higher).
- May not be more than 2 years in duration.
- Approval of minor deviation is the SPD Senior Regional H&H and Water Control Engineer and approval time is two days.

Major Deviation

- All other deviations.
- Approval of major deviation is the SPD Commander and approval time is two weeks.



STATUS OF WATER CONTROL MANUAL (WCM) DEVIATION

Minor Deviation in place December 2014 - March 8, 2016

- Raise the water conservation elevation from 201.6 ft to 205 ft for the flood season (October to March).
- The pool reached elevation 205' about 15 times since 1958 with the last time in 2011, which was the beginning of the drought.
- Dam Safety threshold begins at WSE of 213.5 ft (backward erosion). Chapter 24 Exception was granted by HQUSACE for the duration of the drought.
- The storage volume difference between 205' and 201.6' is 1,325 acre-feet. At an average rate of \$1,000 per acre-foot of water in southern California, the potential increased saving in water conservation is about \$1,325,000 per storm event.



STATUS OF WCM DEVIATION (CONTINUED)

Major Deviation Request

- Los Angeles County Department of Public Works requested a 5 years deviation for water conservation to elevation 205 ft.
- Environmental agency declined to accept a 5 years commitment.
- Current plan is to process a minor 2 years deviation in time for the coming flood season (2016-2018).
- No issue with flood control, dam safety, or policy compliance for major deviation.



LEVEE SAFETY ISSUE: VEGETATION MANAGEMENT GUIDELINES

- PL 84-99: The USACE Emergency Management Authority
 - Program Activities include: Preparedness, Response, ***Rehabilitation***, Water Assistance, Advance Measures, and Hazard Mitigation
- The applicable Federal Regulation and the Engineer Regulation are being updated to reflect better alignment with national preparedness and response frameworks.
- New eligibility requirements are being developed and will incorporate stakeholder feedback.



VEGETATION MANAGEMENT (CONTINUED)

New eligibility requirements:

Meet basic eligibility requirements **PLUS** include demonstrated actions related to preparedness planning; risk communications; and demonstrated performance of operation and maintenance activities.

Levee safety inspections and risk screening are still done by USACE and will be used to inform non-federal sponsor actions, NOT eligibility

Sponsor maintains responsibility for all costs associated with deferred and deficient O&M, including vegetation. **THIS IS NOT AN ELIGIBILITY CONCEPT.**



Discussion



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INFORMATION ON THE BRIEFER AND CREDITS

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Credit to HQUSACE for source information on program status and briefing information (Dam Safety, Levee Safety, and Emergency Management Programs)

BACKUP SLIDES

File Name



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UPDATING INFRASTRUCTURE GOVERNANCE



James Dalton



Eric Halpin

Dam Safety Team



Dave Paul



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National Technical Centers

RMC



Nate Snorteland

MMCC



Robert Simrall

MCX



Pat Morgan

Levee PC



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Levee Safety Team



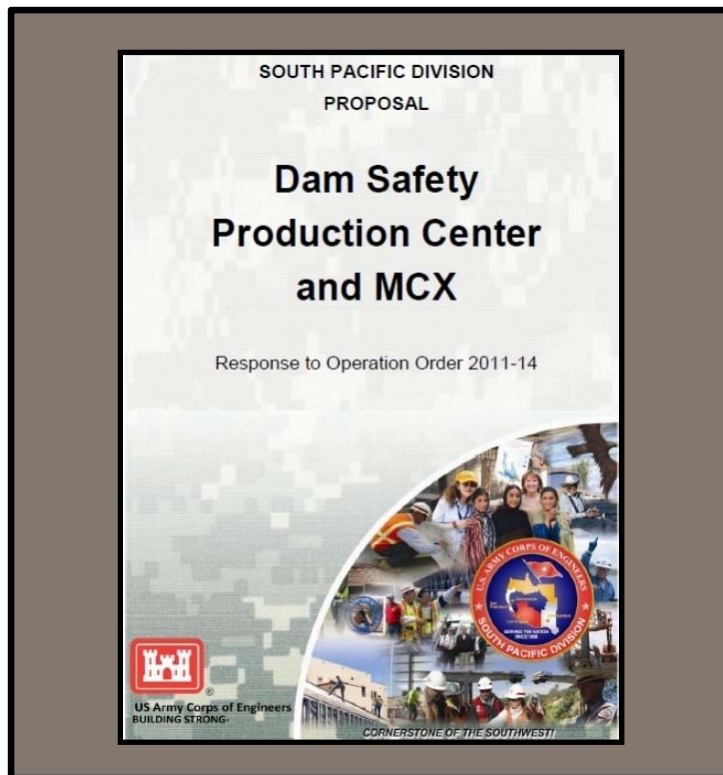
Tammy Conforti



Steve Fink



SPD DSPC



HQ USACE OPORDER 2011-14

Mar 2011 – OPORDER issued

Aug 2011 – Proposals due

Sep 2011 – Proposal presented at HQ

Dec 2011 – NMB approves

Jan 2012 – CC approves

SPD OPORD 2013-05

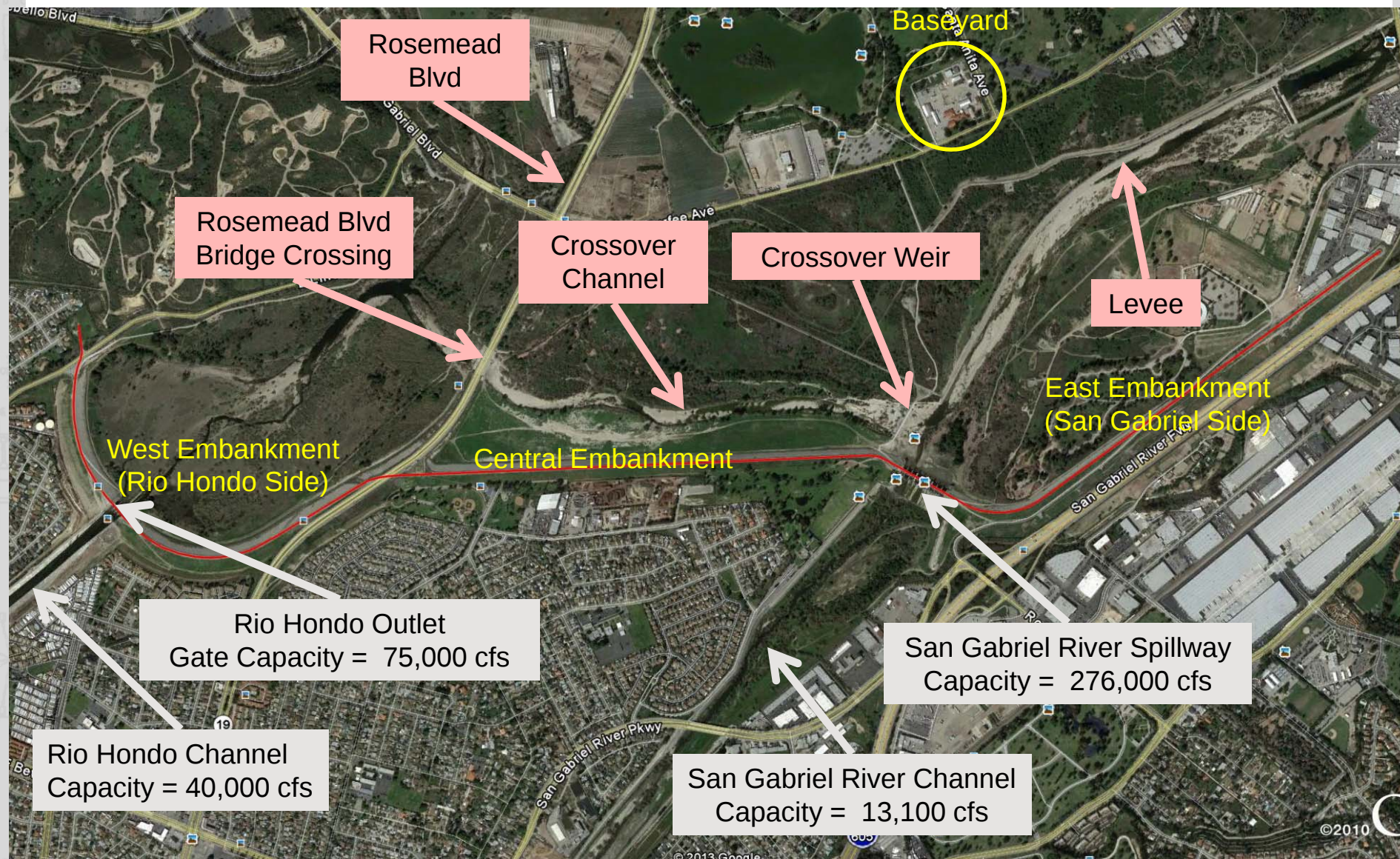
Apr 2013 - Approved est. of SPD DSPC.

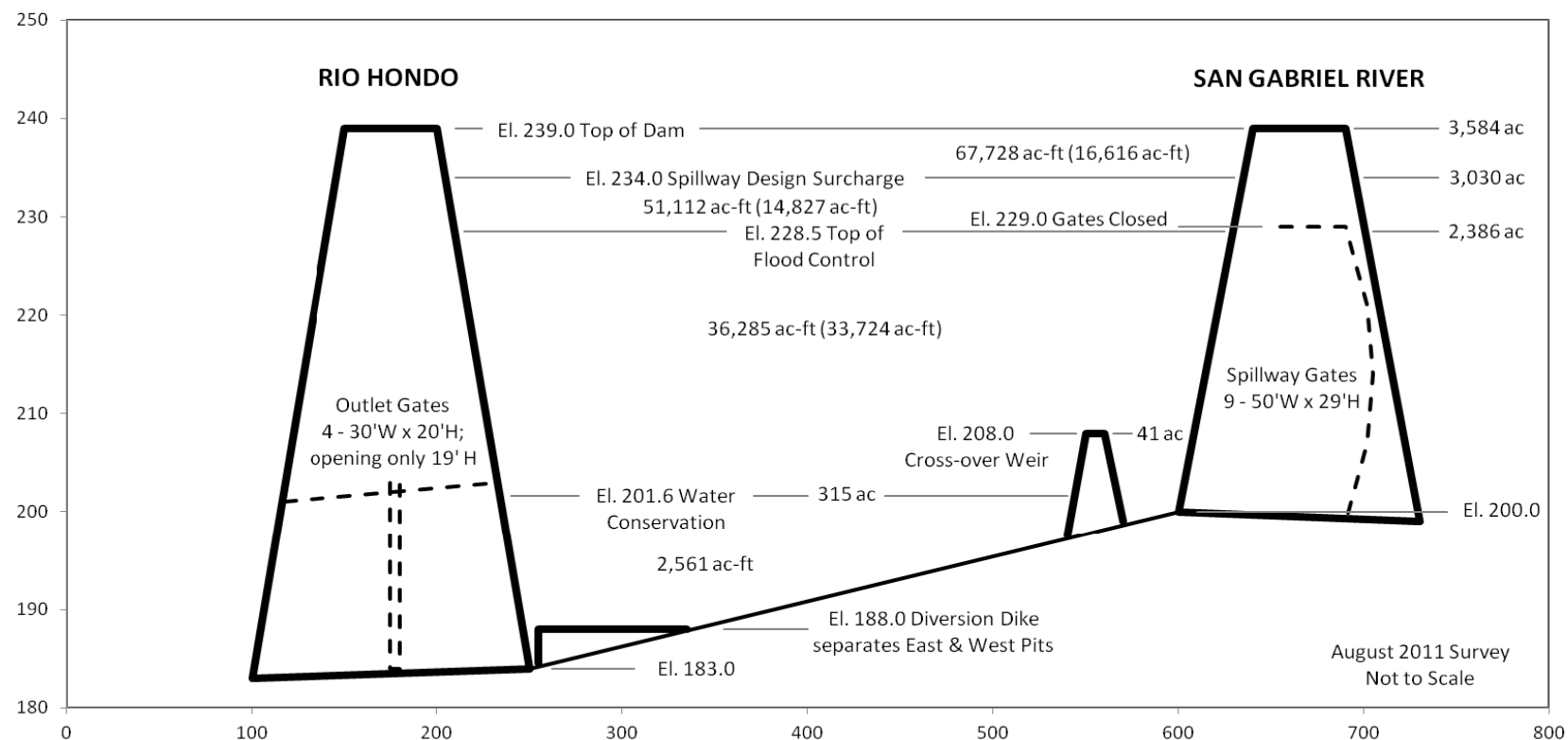
SPD Permanent Order 48-1

Apr 2013 - Approved DSPC reorg plan



WHITTIER NARROWS DAM INFORMATION





Volumes and areas based on August 2011 survey.
 Volumes shown are cumulative values with incremental values in parenthesis.
 Areas shown are cumulative values.
 Elevations in ft NGVD.

Note: There is currently a deviation in place for water conservation operations in the flood control pool to elevation 205.0 ft NGVD when conditions are favorable.

WHITTIER NARROWS DAM
 DAM SAFETY MODIFICATION STUDY

WHITTIER NARROWS DAM RESERVOIR PROFILE



U.S. ARMY CORPS OF ENGINEERS
 LOS ANGELES DISTRICT



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WHITTIER NARROWS DAM – RISK DRIVING FAILURE MODES

Seepage:

- Internal erosion due to seepage and piping through the foundation in the central embankment.
- Internal erosion due to seepage and piping through the foundation in the west embankment.
- Internal erosion due to seepage and piping through the embankment adjacent to the outlet works walls.

Hydrologic:

- Overtopping of the embankment during large flood events.

Premature Opening of Spillway Gates:

- At roughly a 200-year event, the spillway on the San Gabriel River will begin to operate automatically and begin discharges that will be greater than the channel can hold.



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WATER CONTROL MANUALS AND WATER CONTROL PLANS

- “A water control manual defines rules or provides guidance for direction, operation, and management of water storage at an individual project or system of projects in addition to other pertinent information...”
- Central to a Water Control Manual (WCM) is the Water Control Plan (WCP)
 - WCP are developed to ensure that operations of reservoirs conform to objectives and specific provisions of the authorizing legislation.
 - Congress sets requirements such as flood control storage, water supply authorization, hydropower, environmental considerations, etc. Congressional approval is required to make major changes to a reservoir (Reallocation Study).
 - WCP should be reviewed every 10 years as more data is collected. WCM and WCP should be updated as necessary base on change in conditions.
 - Updating of WCP cannot result in major reallocation of the storage space

WATER CONTROL PLANS/MANUAL

Cost of preparation for a WCM is between 100k and ~ few millions.
Environmental and Dam Safety are the driving factors.

Cost of updating a WCM is between 50k and 300k depending on the complexity of issues at each reservoir.

Cost of a Reallocation/Water Supply Feasibility Study is several millions and takes 3-4 years. Results from the feasibility study would be incorporated into the updating of the WCM.

Deviation are temporary changes to WCM. Cost of deviation is between 10k and 100k. Recurring deviations suggest a need to update WCM.



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