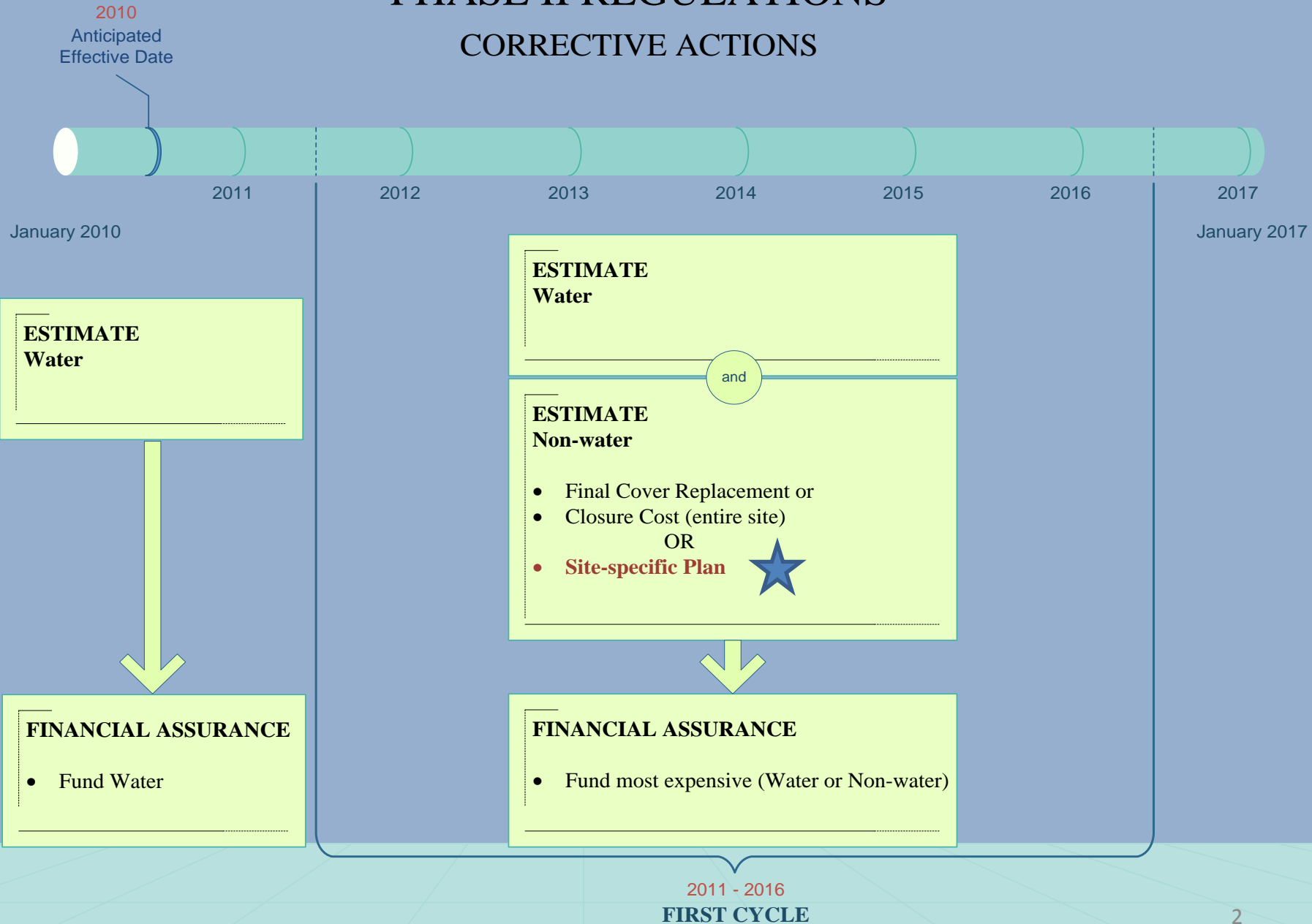


August 19, 2010
ESJPA Meeting
Non-Water Site Specific Corrective Action
Plans

FINANCIAL ASSURANCES PHASE II REGULATIONS CORRECTIVE ACTIONS



Objectives for the TAG and BMP

Presentation to LEAs in September

Workshop on October 11, 2010 (tentative)

Final BMPs in December 2010

Regulations on Plan Requirements

- **Section 22102 CalRecycle-Corrective Action Plan Requirements**
- (a) (1) An evaluation of the known or reasonably foreseeable non-water corrective action needed as a result of each known or reasonably foreseeable causal event:
- (2) Cost estimates, prepared pursuant to section 22101 (c) -(f), for all known or reasonably foreseeable corrective actions described in the plan. The cost estimate with the highest amount must be used to determine the amount of financial assurance required pursuant to section 22221 (b) (2)
- (3) An evaluation of the long-term performance of the final cover system to ensure that it will continue to meet the requirements of section 21140 without the need for corrective action

Definitions

- **Section 22100** (c) (1) ‘Corrective action’ means an activity, including restoring the integrity or establishing the adequacy of a damaged or inadequate containment structure or environmental monitoring or control system, to: bring a landfill into compliance with the applicable requirements, prevent a reasonably foreseeable release, or remediate a known release to the environment. Corrective action does not include routine maintenance.
- (2) ‘Causal event’ means an occurrence that could result in a non-water release corrective action. Causal events include, but are not limited to earthquakes, flooding, tsunami, seiche, fire, precipitation, and degradation of or otherwise inadequate containment structure or environmental monitoring or control system.

Postclosure Requirements

Final Postclosure Maintenance Plan Contents §21830

Slope Stability and Seismic Analyses

- **Slope stability discussion under both static and dynamic conditions**
- **Slope stability report**
- **Seismic analysis report**
 - **Class II MSW Landfills – withstand the maximum credible earthquake**
 - **Class III MSW Landfills – withstand at least the maximum probable earthquake**

Postclosure Requirements

Final Postclosure Maintenance Plan Contents

§21830

- Revegetation Plan
- Final Cover Maintenance Plan
- Drainage collection system maintenance and repair procedures
- Landfill Gas and Environmental Monitoring

'Contingency approach' to determine costs

Recommend the following table be inserted as Attachment 2
as a **cost estimating tool** to your proposed BMP:

Damage	Landfill Cover Corrective Action	Drainage System Corrective Action	Gas Collection System Corrective Action	Gas Monitoring System Corrective Action	Leachate Collection System Corrective Action	Site Security Corrective Action	Other Landfill Infrastructure Corrective Action
100%	\$ (AA)	\$	\$	\$	\$	\$	\$
90%	\$	\$	\$	\$	\$	\$	\$
80%	\$	\$	\$	\$	\$	\$	\$
70%	\$	\$	\$	\$	\$	\$	\$
60%	\$	\$	\$	\$	\$	\$	\$
50%	\$	\$	\$	\$	\$	\$	\$
40%	\$	\$	\$	\$	\$	\$	\$
30%	\$	\$	\$	\$	\$	\$	\$
20%	\$	\$	\$	\$	\$	\$	\$
10%	\$	\$	\$	\$	\$	\$	\$

AA-Title 27, Section 22101(b) (1) which is the cost of complete replacement of the final cover

Discussion Only

<u>Causal Event</u>	<u>BMP to Define or Characterize the Causal Event</u>	<u>Design Standard</u>
Earthquake	Maximum Credible Earthquake	Maximum Probable Earthquake
Flood	500-Year Flood	100-Year Flood
Precipitation	1000-Year 24-Hr Storm	100-Year 24-Hr Storm
Tsunami	Designated Inundation Zone	Not Applicable
Seiche	Within ½ Mile of Lake	Not Applicable
Fire	Designated Moderate or Higher Fire Hazard	Not Applicable

Discussion Only

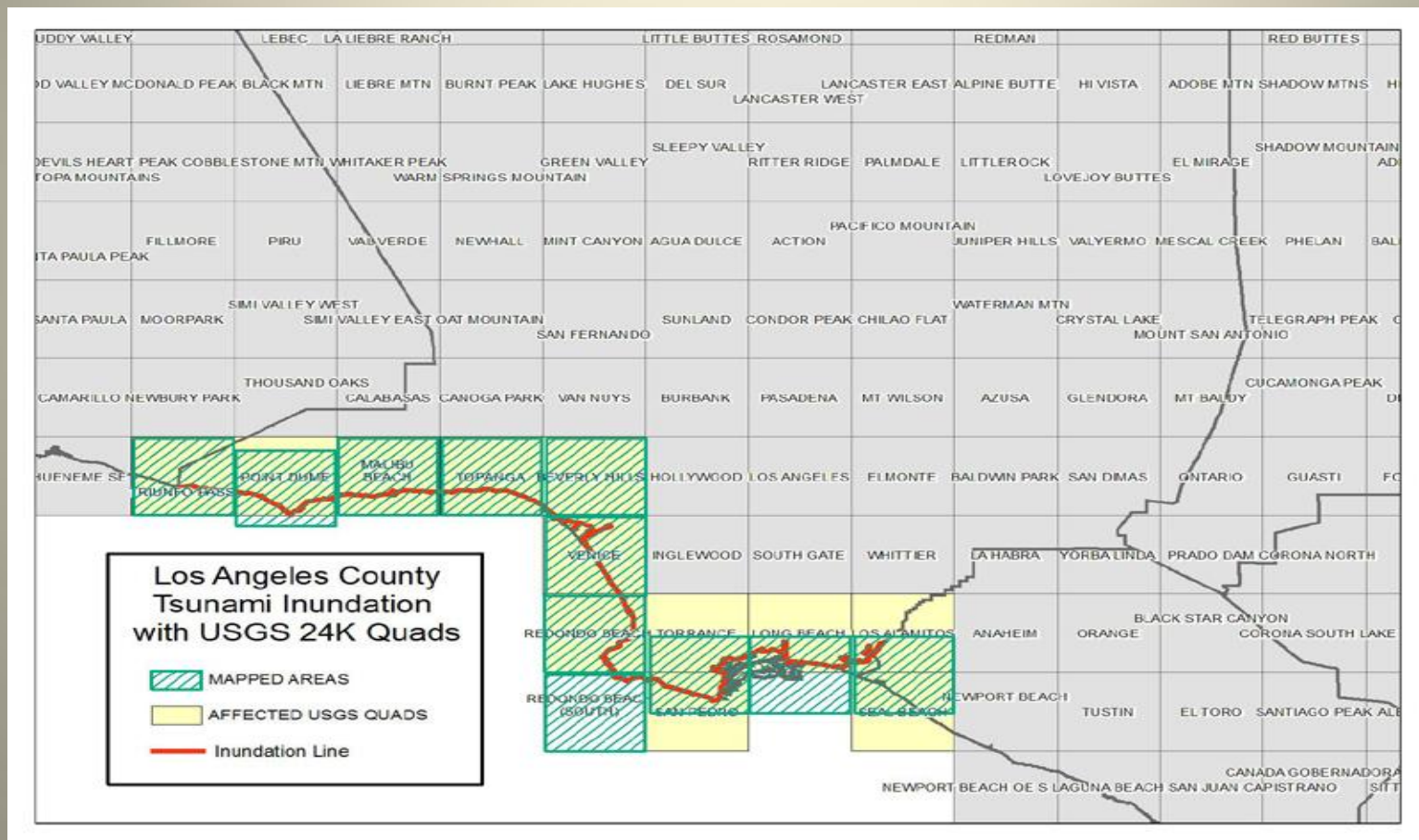
<u>Causal Event</u>	<u>BMP to Define or Characterize the Causal Event</u>	<u>Design Standard</u>
Tsunami	Designated Inundation Zone	Not Applicable
Seiche	Within ½ Mile of Lake	Not Applicable
Fire	Designated Moderate or Higher Fire Hazard	Not Applicable

Tsunami

- BMP for the tsunami as a causal event is:
- Tsunamis are considered de minimis as a causal event if the landfill is located in an area that is not designated to be prone to be inundated by a tsunami by the Department of Conservation or local emergency response agency.
- For landfills located in an area that is prone to be inundated by a tsunami, the CA Plan needs to address the potential impacts and damage that may result.

Tsunamis/Seiches

- Los Angeles County Tsunami Inundation Maps



Seiche

- BMP for the seiche as a causal event is:
- Seiche is considered de minimis as a causal event, if the landfill is located greater than ½ mile away from a lake or a landlocked bay.
- Landfill that located within ½ mile of a lake or landlocked bay needs to identify the height of the wave and evaluate if the wave will inundate the landfill and cause any damage.

Fire

BMP for a fire as a causal event is that landfills located within 1,000 feet of fire hazard zones determined by California Department of Forestry and Fire Protection (Cal Fire) or the local fire control agency as moderate, high, or very high must evaluate the potential damage to surface structures, vegetation and irrigation systems, and utilities.

- It is recommended that an assumption that 80% of the surface structures are destroyed if the landfill is located in a very high fire hazard zone, reduced by engineered systems to mitigate surface fires.
- For landfills located in high fire hazard zone, the recommendation is that an assumption that 70% of the surface structures are destroyed.
- For landfills located in a moderate fire hazard zone, the recommendation is that an assumption that 50% of the surface structures are destroyed.
- For landfills not located in the above zones, a contingency of 20% to replace surface structures is recommended.

Flood

BMP for the flood as a causal event is:

- Flooding is considered de minimis as a causal event if the landfill is not located in the 500-year flood zone or the elevation of the landfill is above the depth of the flood event.
- For the purposes of determining corrective action, any landfill located within the 500-year flood zone needs to assess the potential damage resulting from the 500-year flood.

Example of the 100-year versus 1000-year storm event

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION ORDER NO. R5-2004-0058
WASTE DISCHARGE REQUIREMENTS FOR
CRIMSON RESOURCE MANAGEMENT CORP. ASPHALTO STANDARD
LEASE, ASPHALTO OILFIELD, KERN COUNTY

The California Regional Water Quality Control Board,
Central Valley Region, (hereafter Regional Board) finds
that:

12. The 100-year and 1000-year, 24-hour precipitation events calculated by DWR are 2.03 and 2.63 inches, respectively

Forecasting California's Earthquakes—What Can We Expect in the Next 30 Years?

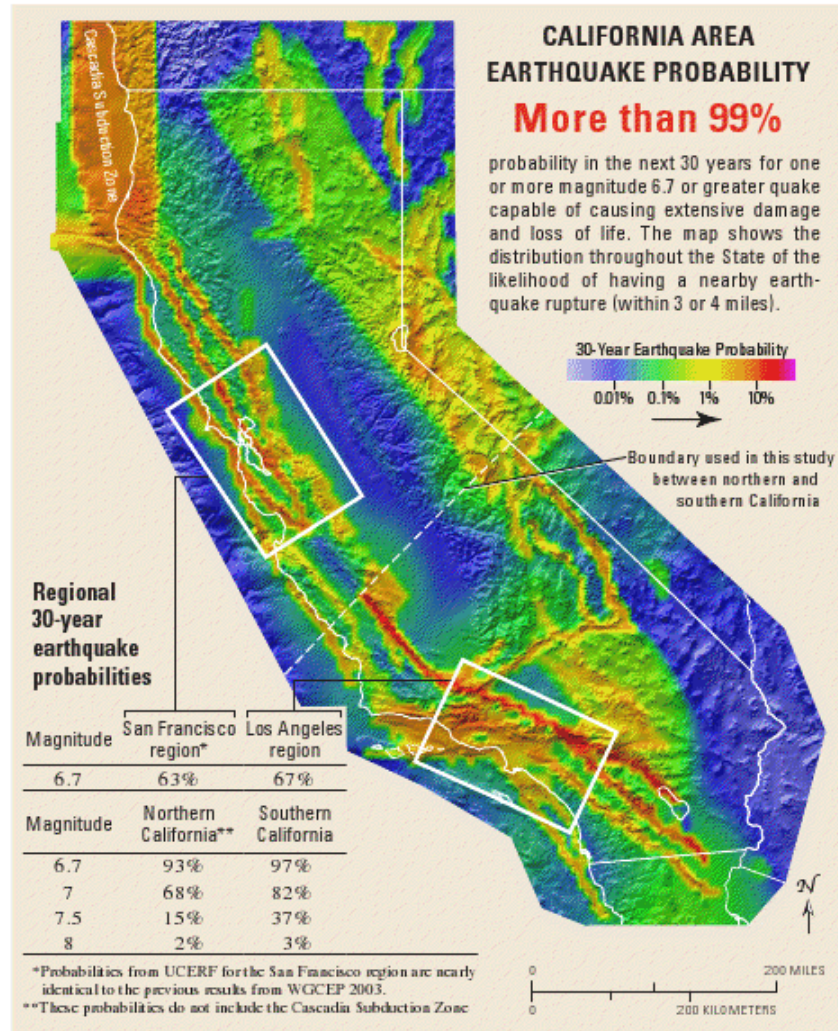
In a new comprehensive study, scientists have determined that the chance of having one or more magnitude 6.7 or larger earthquakes in the California area over the next 30 years is greater than 99%. Such quakes can be deadly, as shown by the 1989 magnitude 6.9 Loma Prieta and the 1994 magnitude 6.7 Northridge earthquakes. The likelihood of at least one even more powerful quake of magnitude 7.5 or greater in the next 30 years is 46%—such a quake is most likely to occur in the southern half of the State. Building codes, earthquake insurance, and emergency planning will be affected by these new results, which highlight the urgency to prepare now for the powerful quakes that are inevitable in California's future.

What Is an Earthquake Rupture Forecast?

Californians know that their State is subject to frequent—and sometimes very destructive—earthquakes. Accurate forecasts of the likelihood of quakes can help people prepare for these inevitable events. Because scientists cannot yet make precise predictions of the date, time, and place of future quakes, forecasts are in the form of the probabilities that quakes of certain sizes will occur during specified periods of time.

In our daily lives, we are used to making decisions based on probabilities—from weather forecasts (such as a 30% chance of rain) to the annual chance of being killed by lightning (about 0.0003%). Similarly, earthquake probabilities derived by scientists can help us plan and prepare for future quakes.

Earthquake forecasts for California have been developed in the past by multidisciplinary groups of scientists and engineers, each known as a Working Group on California Earthquake



Earthquake Rupture Forecast, Version 2, or "UCERF" (U.S. Geological Survey (USGS) Open-File Report 2007-1437, <http://pubs.usgs.gov/of/2007/1437/>). Organizations sponsoring WGCEP 2007 include the USGS, California Geological Survey, and the Southern California Earthquake Center. The comprehensive new forecast builds on previous studies and also incorporates abundant new data and improved

pebble tossed into a pond. The shaking that occurs as seismic waves pass by causes most quake damage. The strength of the waves depends partly on the quake's magnitude, which is a function of the size of the fault that moves and the amount of slip.

The UCERF study's goal was to determine probabilities for different parts of California of earthquake ruptures of various magnitudes

Earthquake

BMP for the earthquake as a causal event is comprised of three elements: (this is subject of August 30th meeting)

- Use MCE to compare the design of the landfill to determine the potential damage due to ground movement and ground acceleration.
- Evaluate the potential effects of liquefaction if the landfill is located in a Seismic Hazard Zone.
- Evaluate for the potential damage from fault ruptures if the landfill is located within 200 feet of Holocene fault zones.

Wrap-up

Comments on content and causal events?

Next steps?

Is end of year feasible?