

# Earthquake Preparedness

Planning Committee

April 10, 2018

# Agenda



- Preparedness programs
- Mutual assistance
- Community Outreach Preparedness Planning
- Next steps

# Preparedness Programs



- Directed by Policy 7.03
  - Emergency Operations Plan (EOP)
  - Business Continuity Plans (BCPs)

# Key Performance Indicators



KPI	Target	Status
Update EOP	Every 2 years	Completed
Conduct EOT Exercise	Annual	Completed
Update BCP	Every 2 years	On Target
Conduct BCP Exercise	Annual	On Target
Draft Water Quality Emergency Communication Plan	Annual	Completed



# Mutual Assistance



- California Water/Wastewater Agency Response Network (CalWARN)
  - California water and wastewater utilities
- Multi-Agency Water Mutual Assistance Agreement (MAWMAA)
  - Los Angeles Dept. of Water and Power (LADWP) and Las Vegas Valley Water District (LVVWD)

# Coordinating with Cities and Counties



- Support city and county planning to distribute potable water post earthquake
- Provide resources and support as available until Cal OES/FEMA can establish mass care systems
- Coordinate water system recovery with cities and counties
- Conduct emergency preparedness tours

# Next Steps



- Continue coordinating with cities and counties
  - April 19 meeting and tour
- Exercise mutual assistance process
  - August workshop with LVVWD and LADWP
- HayWired (Next Presentation)
  - Damage to District Infrastructure
  - Wide spread outages water and WW services



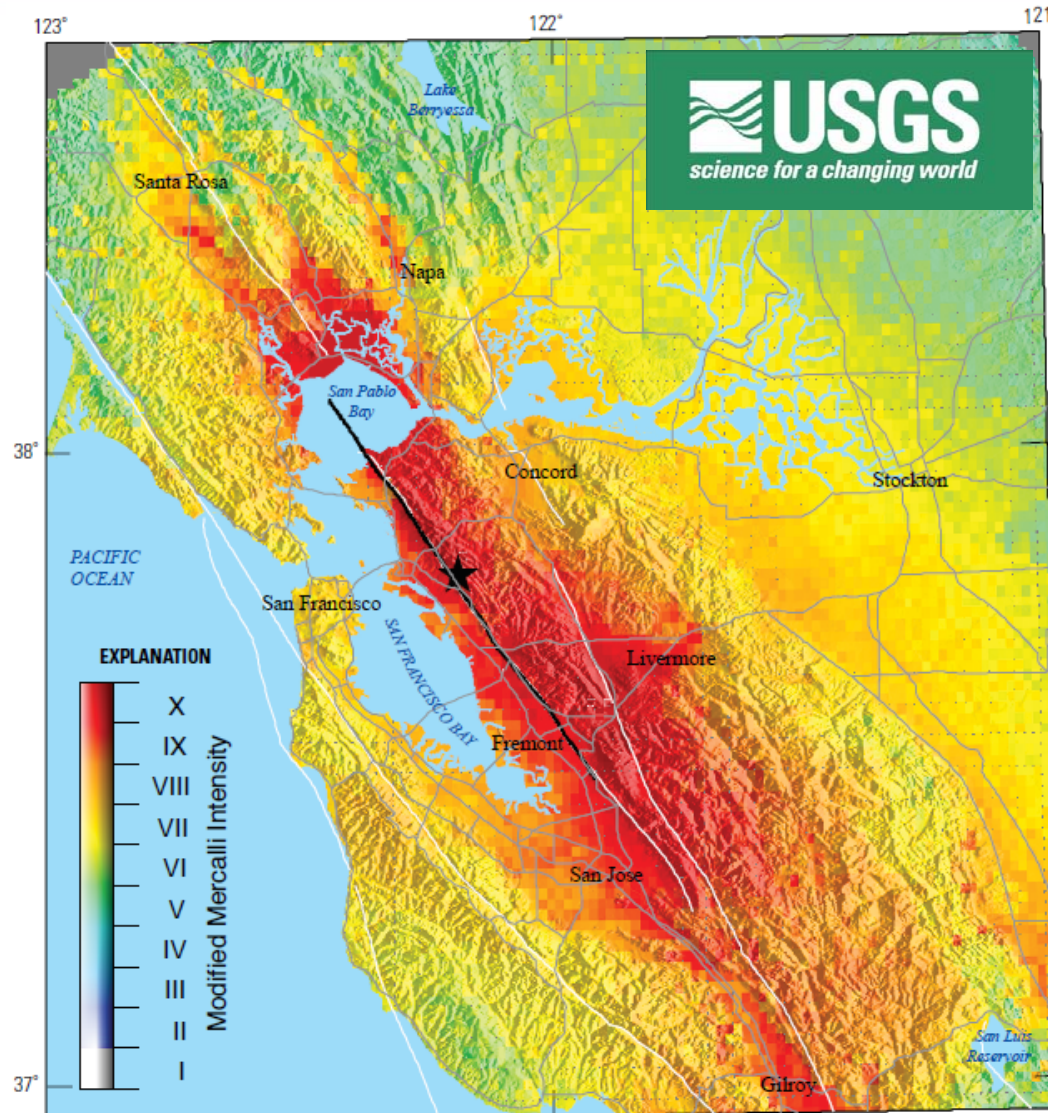


*EAST BAY MUNICIPAL UTILITY DISTRICT*

# **Earthquake Preparedness HayWired Report Update**

**Planning Committee Meeting  
April 10, 2018**

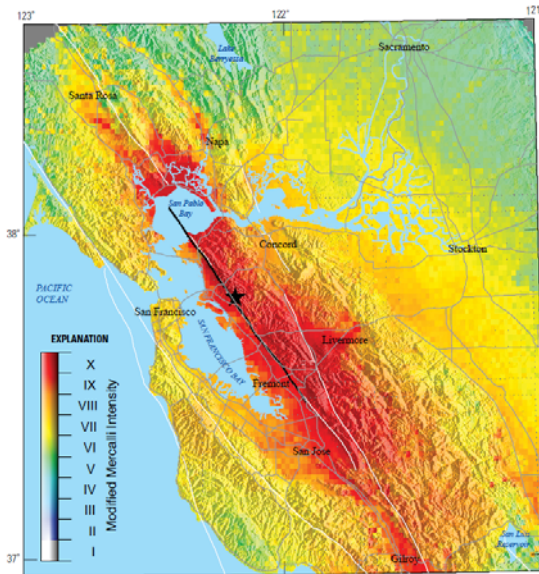
# What is HayWired?



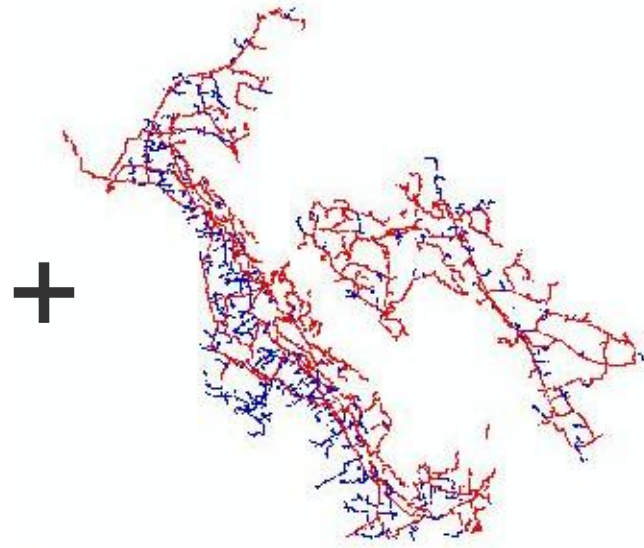
- Hayward Fault
- Main Shock M 7.0 EQ
- 16 Aftershocks  $\geq$  M 5.0 EQs
- Oakland Epicenter
- 800 Deaths
- 16,000 Non-Fatal Injuries
- EQ Damage \$86B
- Fire Damage +\$30B



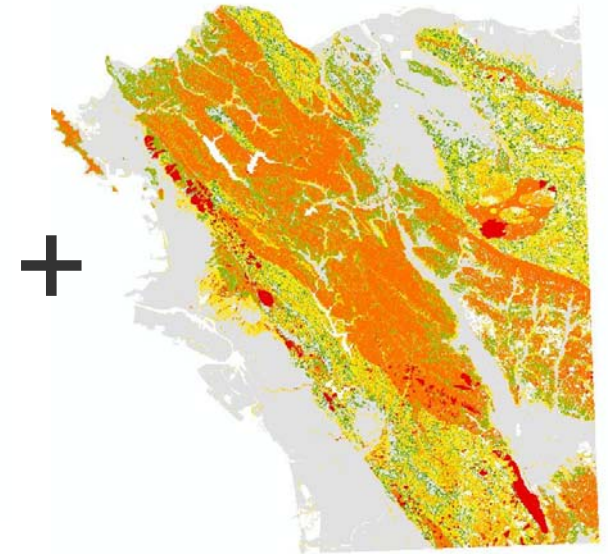
# HayWired Prediction Model to Estimate Pipeline Damage



HayWired



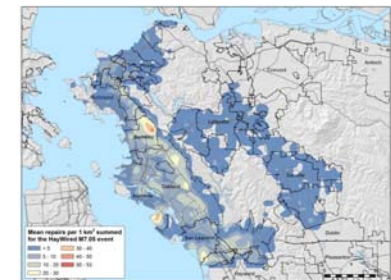
Pipelines



Geohazards

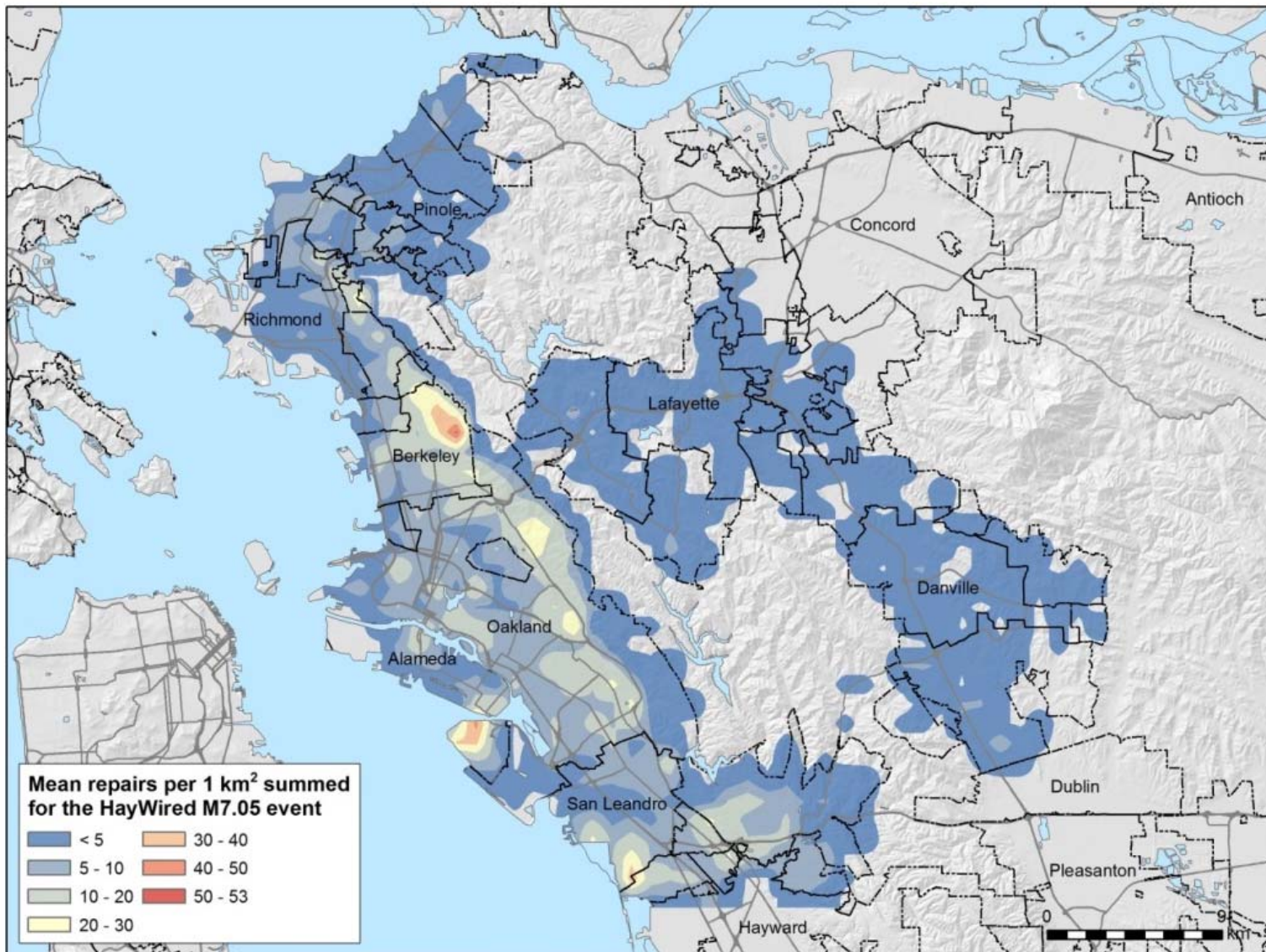


Prediction Model



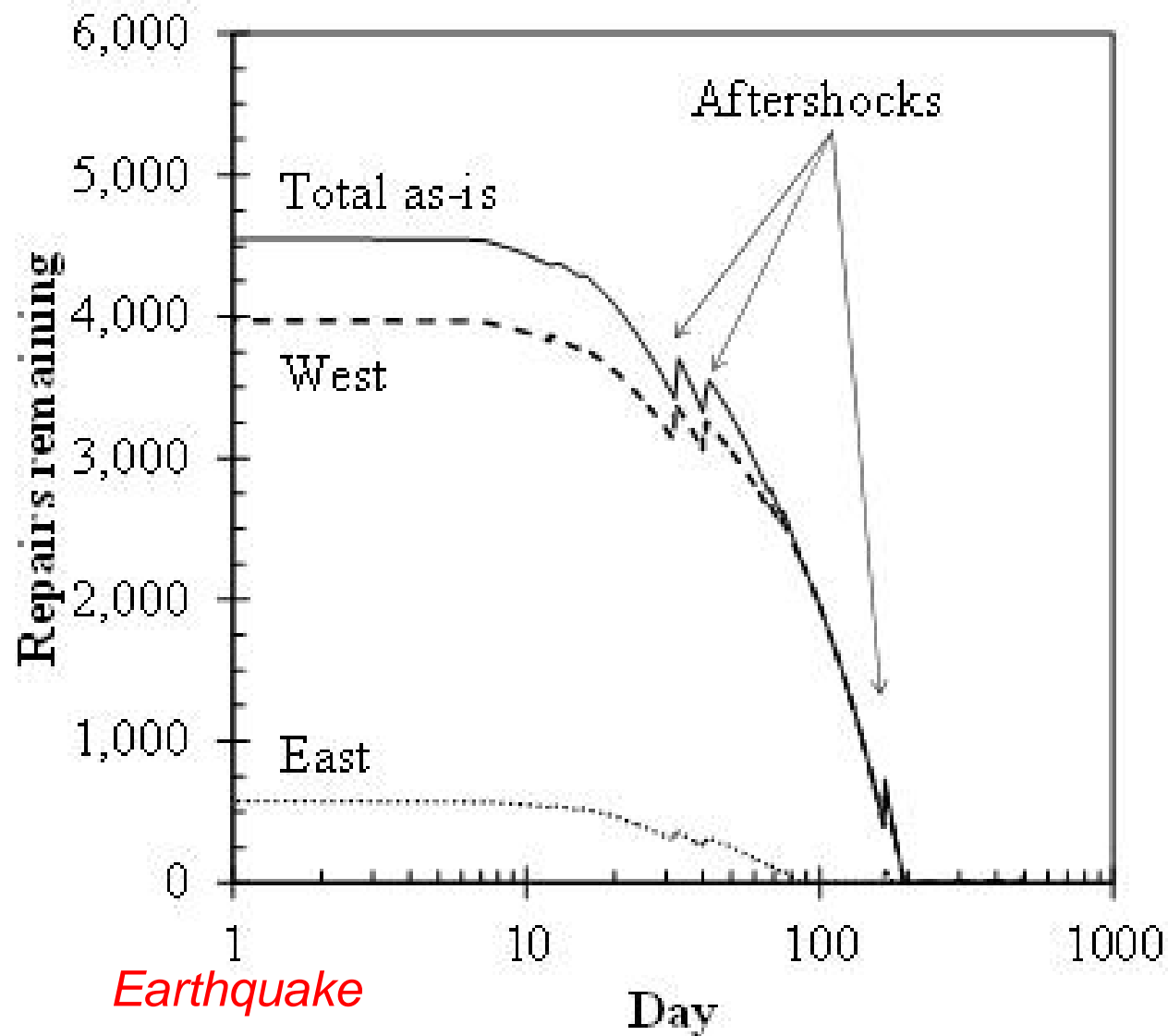
Results

# HayWired Prediction Model Estimated Pipeline Damages

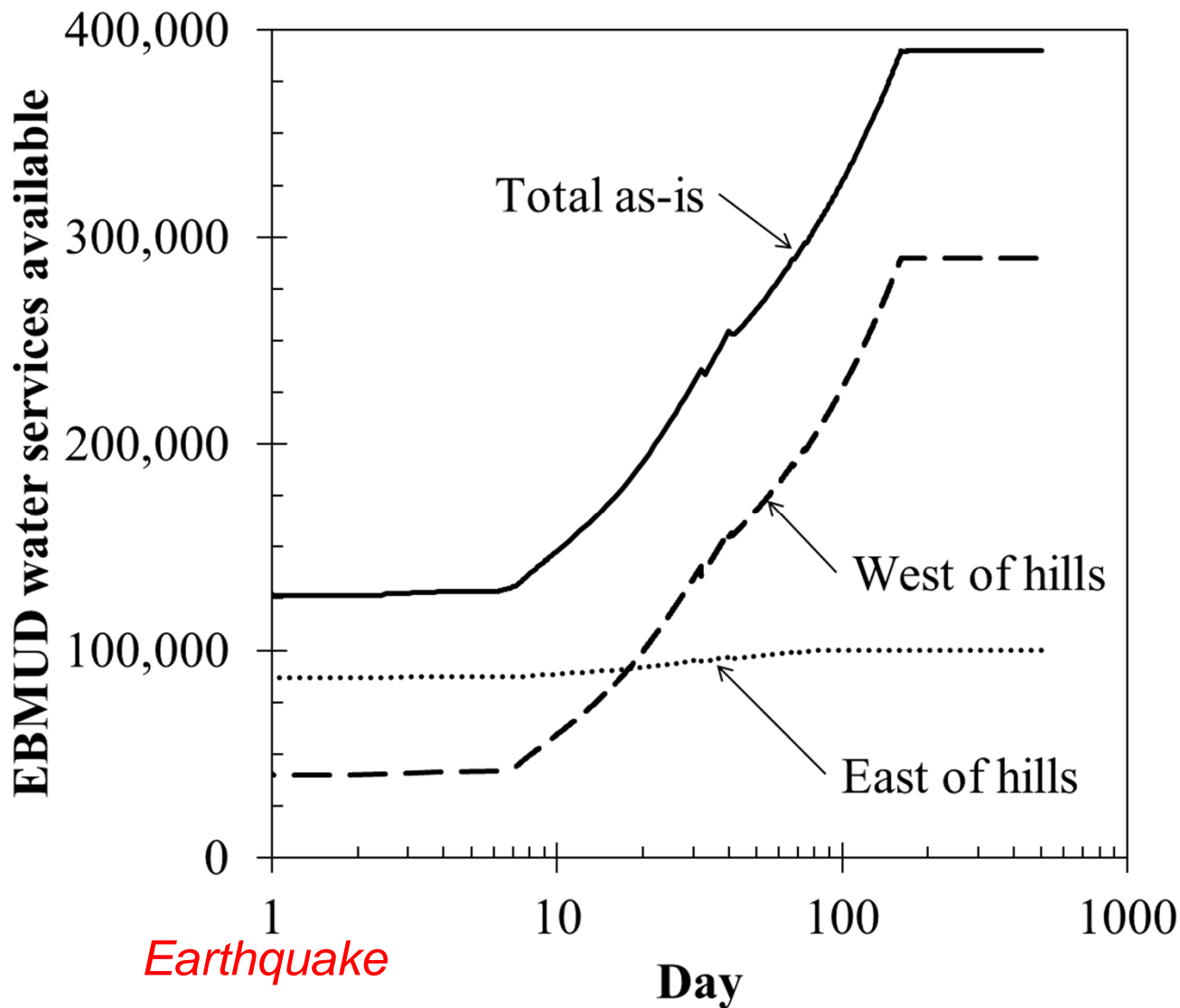




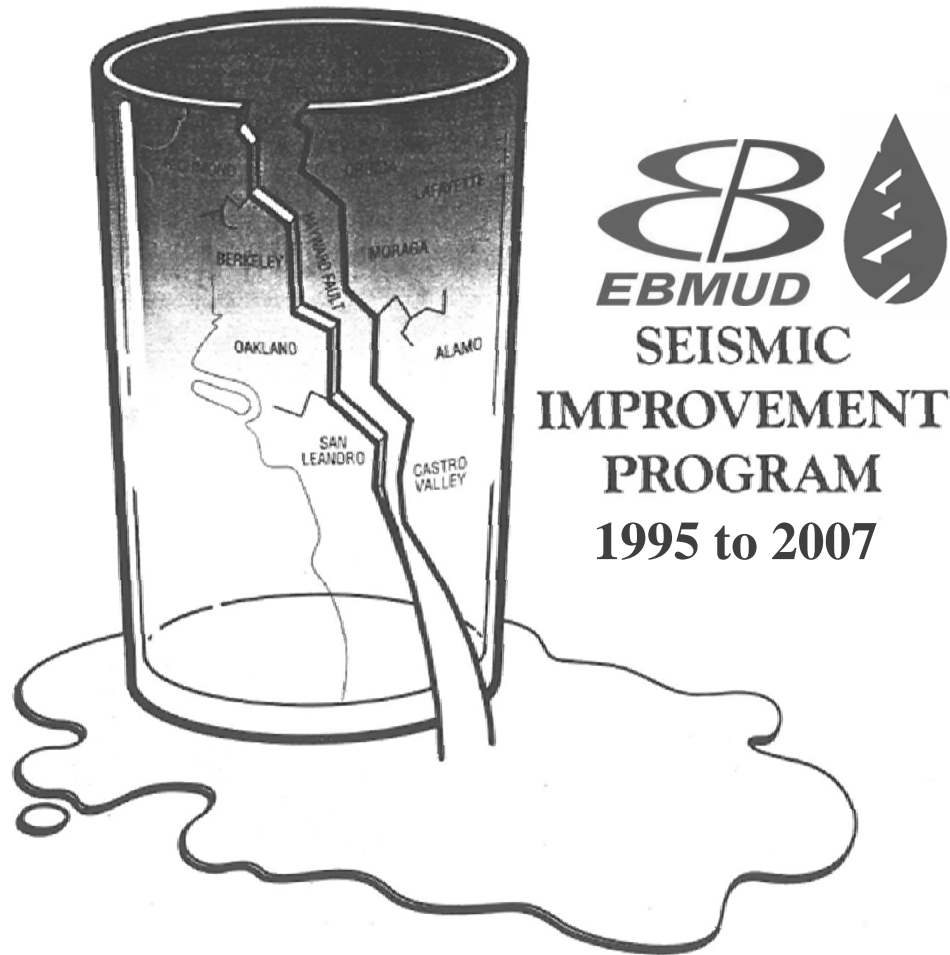
# Repairs Remaining After Earthquake



# Service Recovery after Earthquake



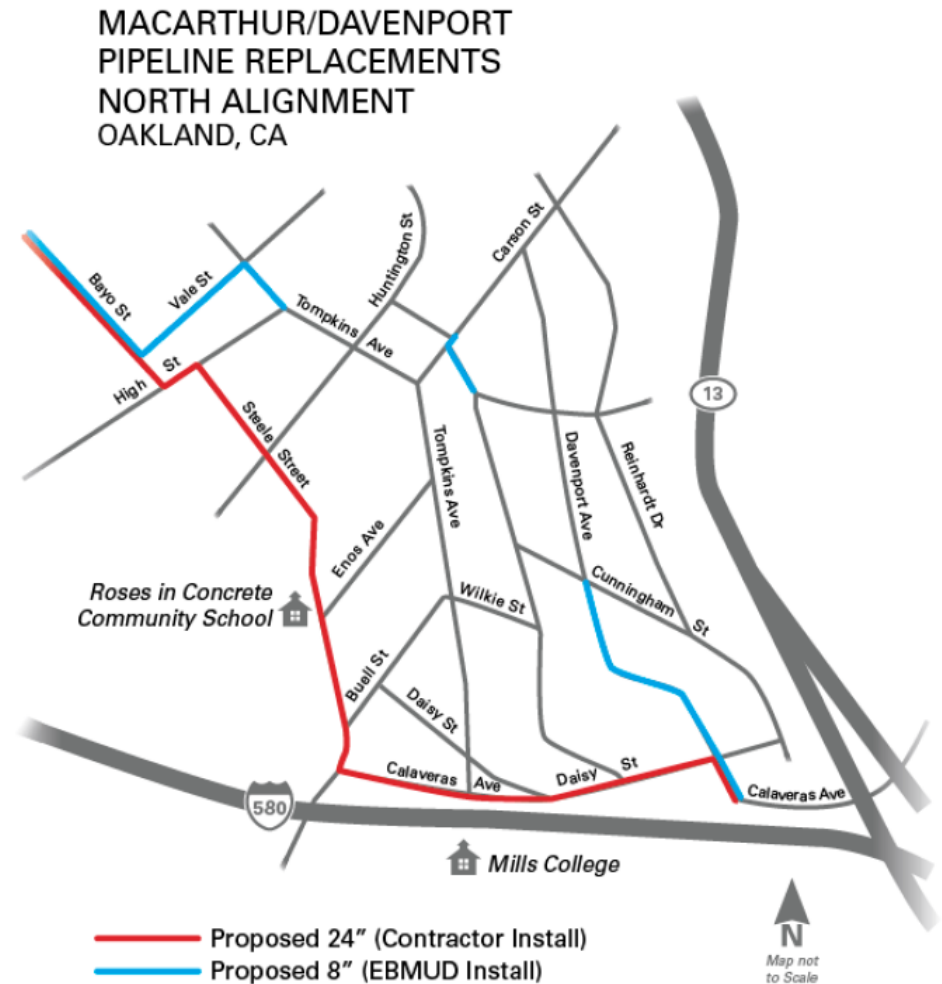
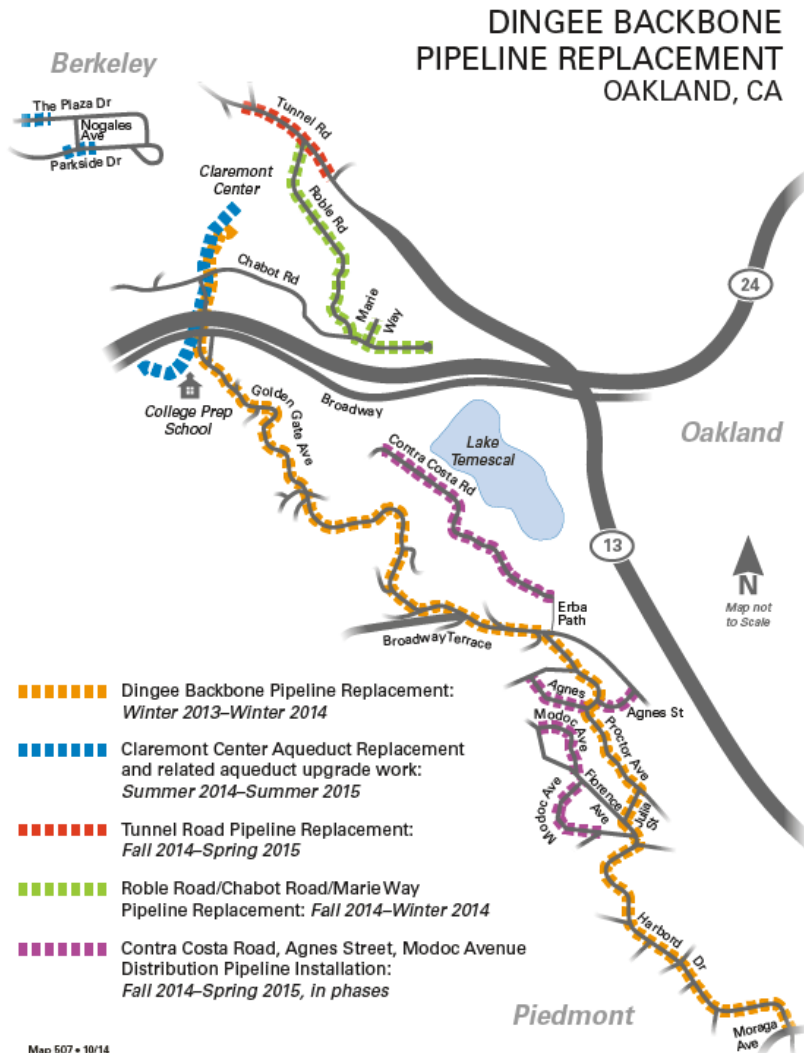
# Seismic Improvement Program



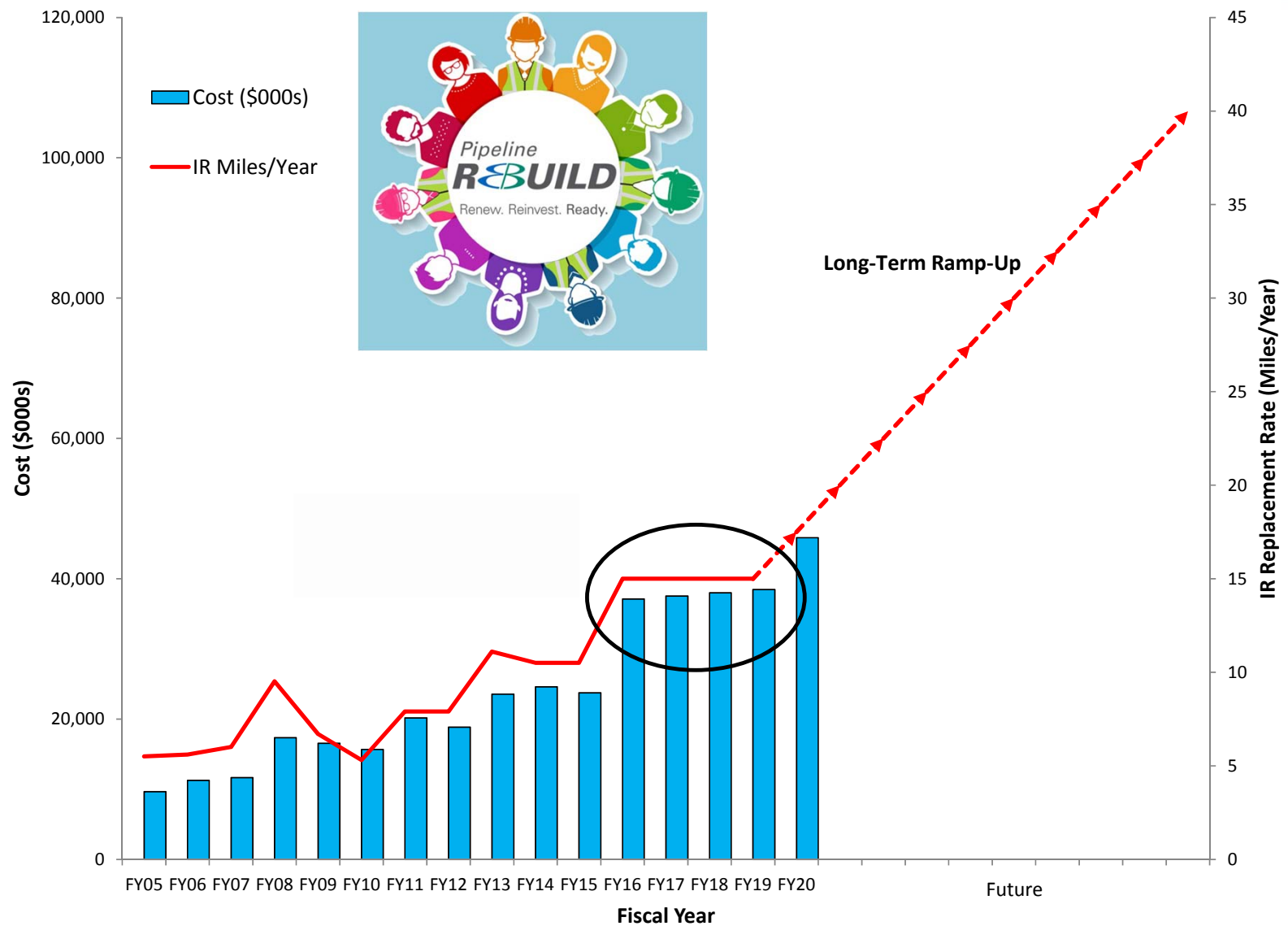
## Program Scope from 1994

- Storage Reservoirs
  - **\$66.5M**
- Pumping Plants
  - **\$4.9M**
- Claremont Tunnel Improvements
  - **\$24.5M**
- Southern Loop Installation
  - **\$30.6M**
- Fault Crossing Improvements
  - **\$49.5M**
- Buildings/Equipment Anchorages
  - **\$8.5M**
- Water Treatment Plants
  - **\$3.8M**

# Large Diameter Pipeline Replacement Program



# Pipeline Rebuild Program Increase Pipeline Replacements

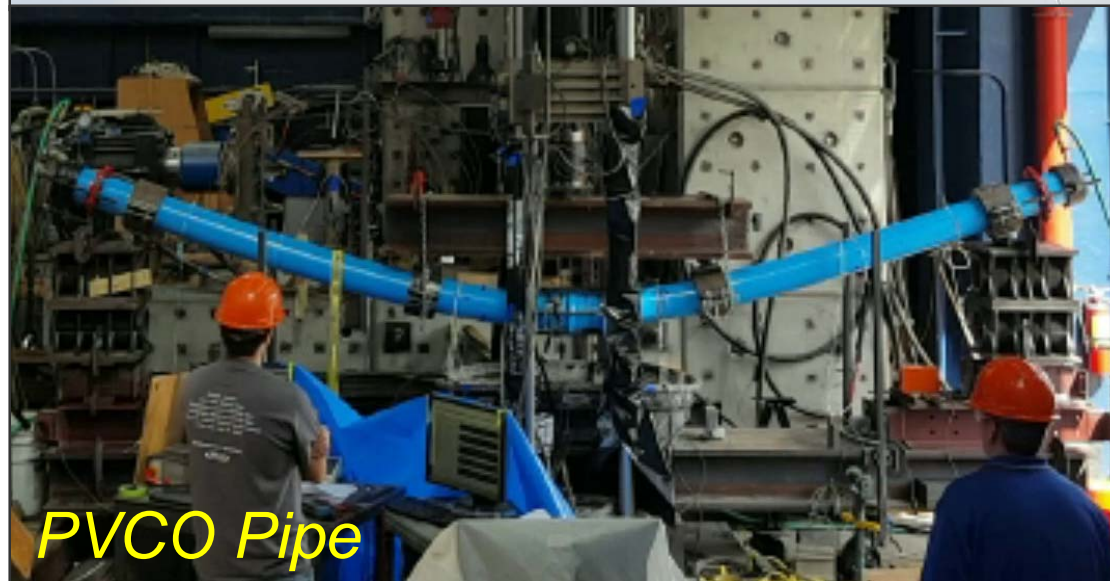




# Pipeline Rebuild Program Earthquake Resistant Materials

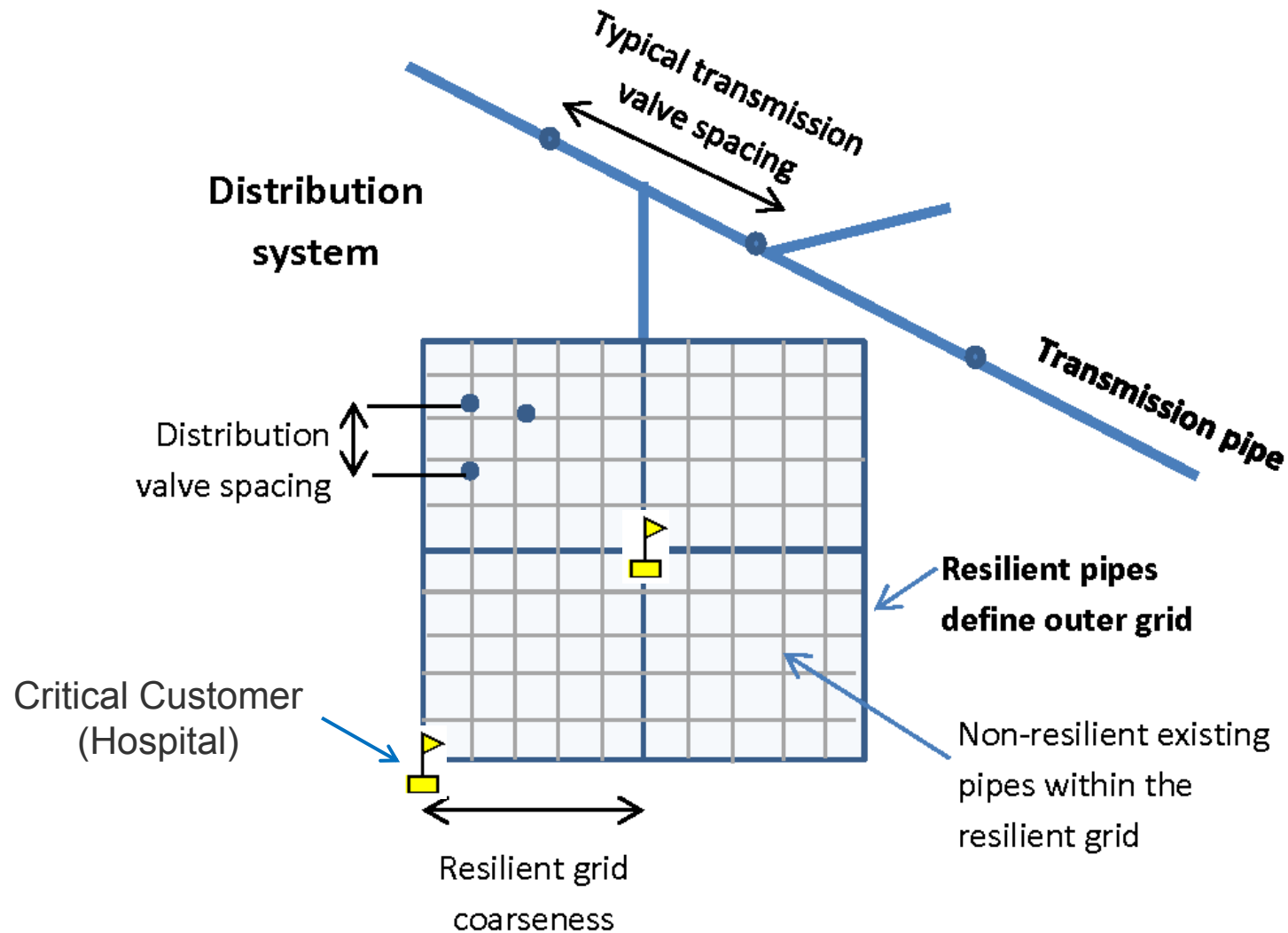


*Ductile Iron Pipe*



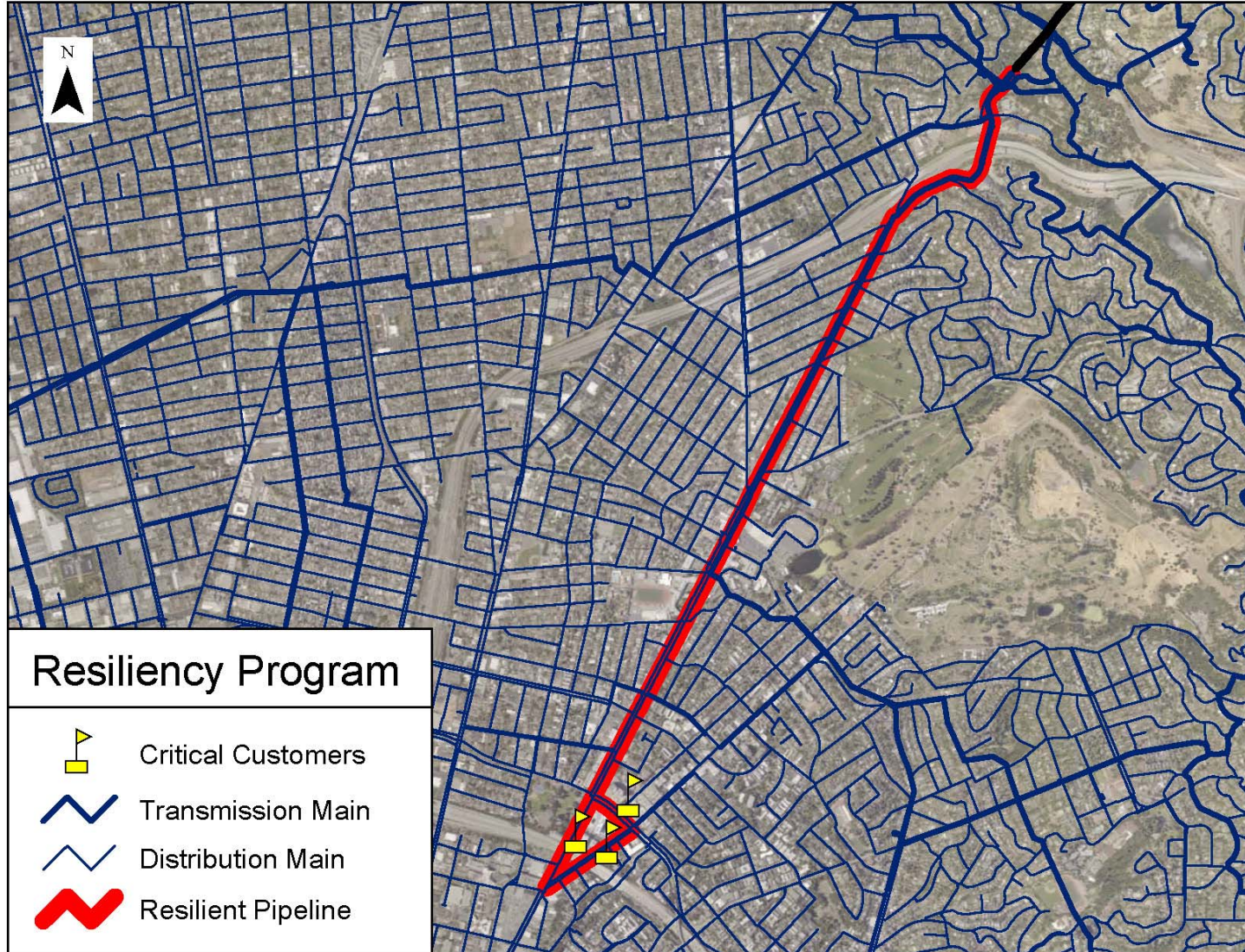
*PVC Pipe*

# Resilient Network





# Resilient Network Example





# Summary & Next Steps



*Integrating across disciplines...*



## **SOCIAL SCIENCES**

**HayWired Volume III: Consequences**

***November 2018***

## **ENGINEERING**

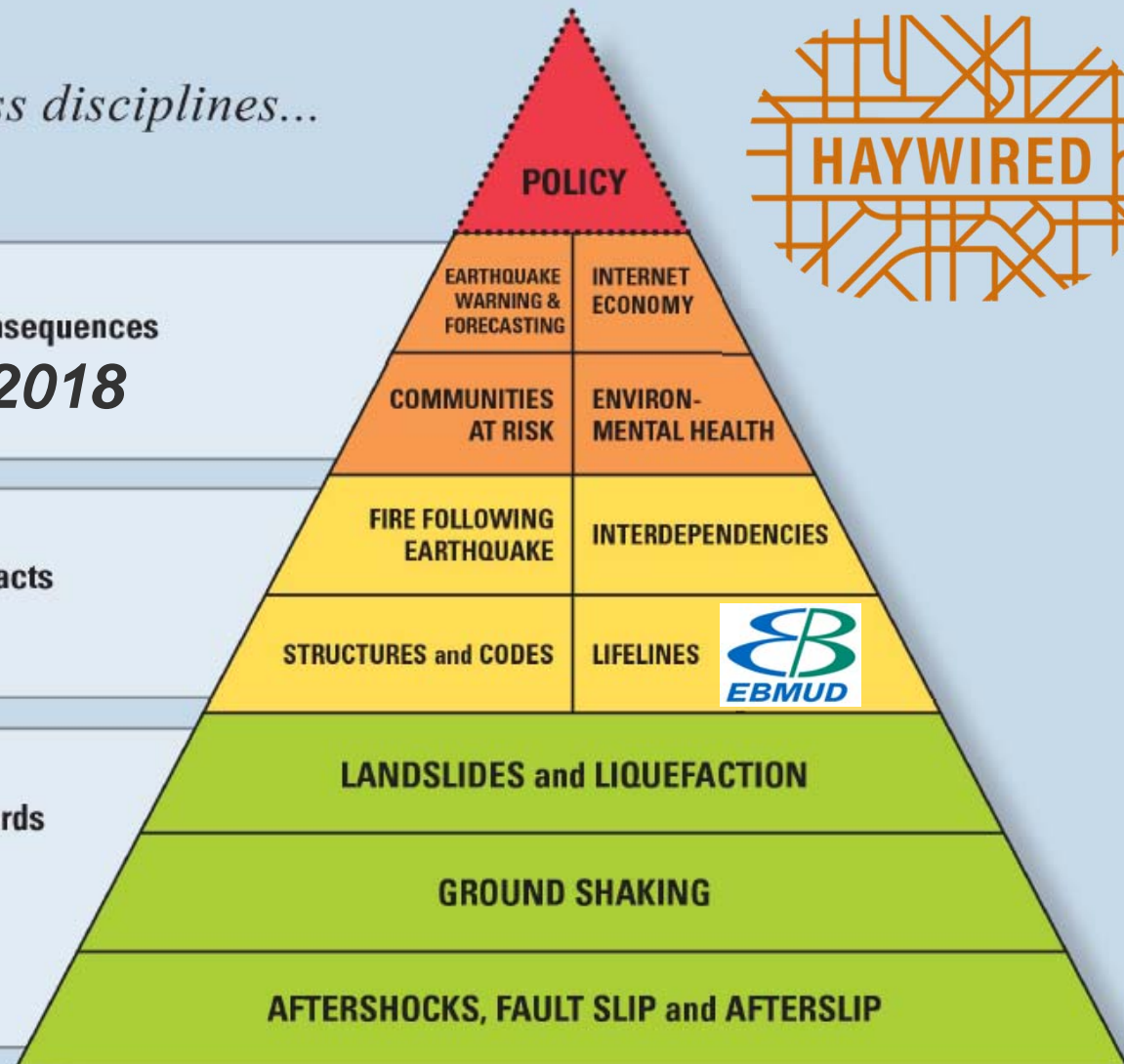
**HayWired Volume II: Impacts**

***April 2018***

## **EARTH SCIENCE**

**HayWired Volume I: Hazards**

***April 2017***





# **Semi-Annual Regulatory Compliance Update**

Planning Committee

April 10, 2018

# Agenda



- Enforcement review
- Enhanced Compliance Action
- Main WWTP settlement agreement
- Orinda WTP compliance
- Poison Pond remediation
- Workplace health and safety
- Upcoming activities

# Enforcement Review



- Strategic Plan KPI
  - Zero National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirement (WDR) permit Notices of Violation (NOVs) received
- This reporting period
  - 0 NOVs for NPDES or WDRs
  - 0 NOVs for air permits

# Enhanced Compliance Action



- Settlement for three 3 breaks in 2015/2016
  - \$382,095 suspended pending completion of Enhanced Compliance Action
- Install 1,000 leak detection loggers at 485 locations where pipes cross or are near creeks
- To date, 509 loggers deployed at 264 locations

# Main WWTP Settlement Agreement



- Main WWTP Air Permit
  - Exceeded hydrogen sulfide limit 2 times in digester gas in 2016
  - \$8,000 settlement with BAAQMD
  - New limit changed from 340 ppm instantaneous to 200 ppm annual average

# Orinda WTP Compliance



- 230,000 gallon chlorinated water discharge in September
- Root cause investigation identified several improvements
- Presented findings to Regional Board in January
- Modifications in progress



# Poison Pond Before



# Poison Pond Remediated



# Workplace Health and Safety

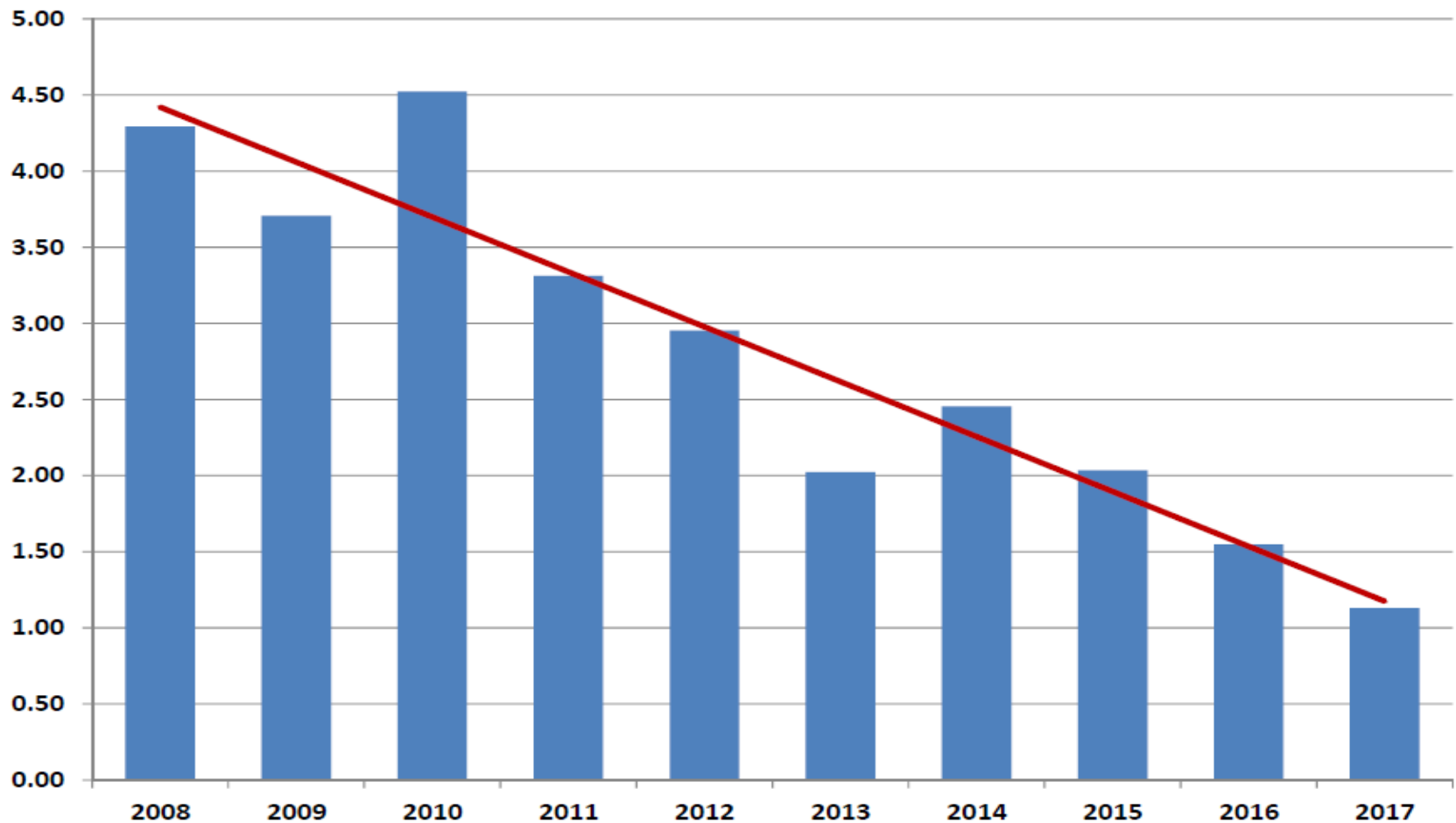


- 2 Cal OSHA citations related to partial finger amputation in March 2017
  - General Violation related to lack of training (\$935 fine)
  - Accident Related Serious Violation for lack of a machine guard (\$22,500 fine)
- Negotiated fine for serious violation to \$10,800
- Corrective actions
  - All Piranhas were shut down and evaluated
  - Piranha representative reviewed machines and provided training
  - Machine guards were added where missing

# Lost Time Injury Rate



District Lost Time Injury Rate



# Upcoming Activities



- Orinda WTP Filter Backwash improvements
- Statewide Mercury in Reservoirs Program
- Enhanced Compliance Action deployment and quarterly reports
- Proposed Workplace Violence Prevention Regulation





# **Semi-Annual Water Quality Update**

Planning Committee

April 10, 2018

# Drinking Water Standards



- The District met all Federal and State drinking water standards in 2017



# Water Quality Goals



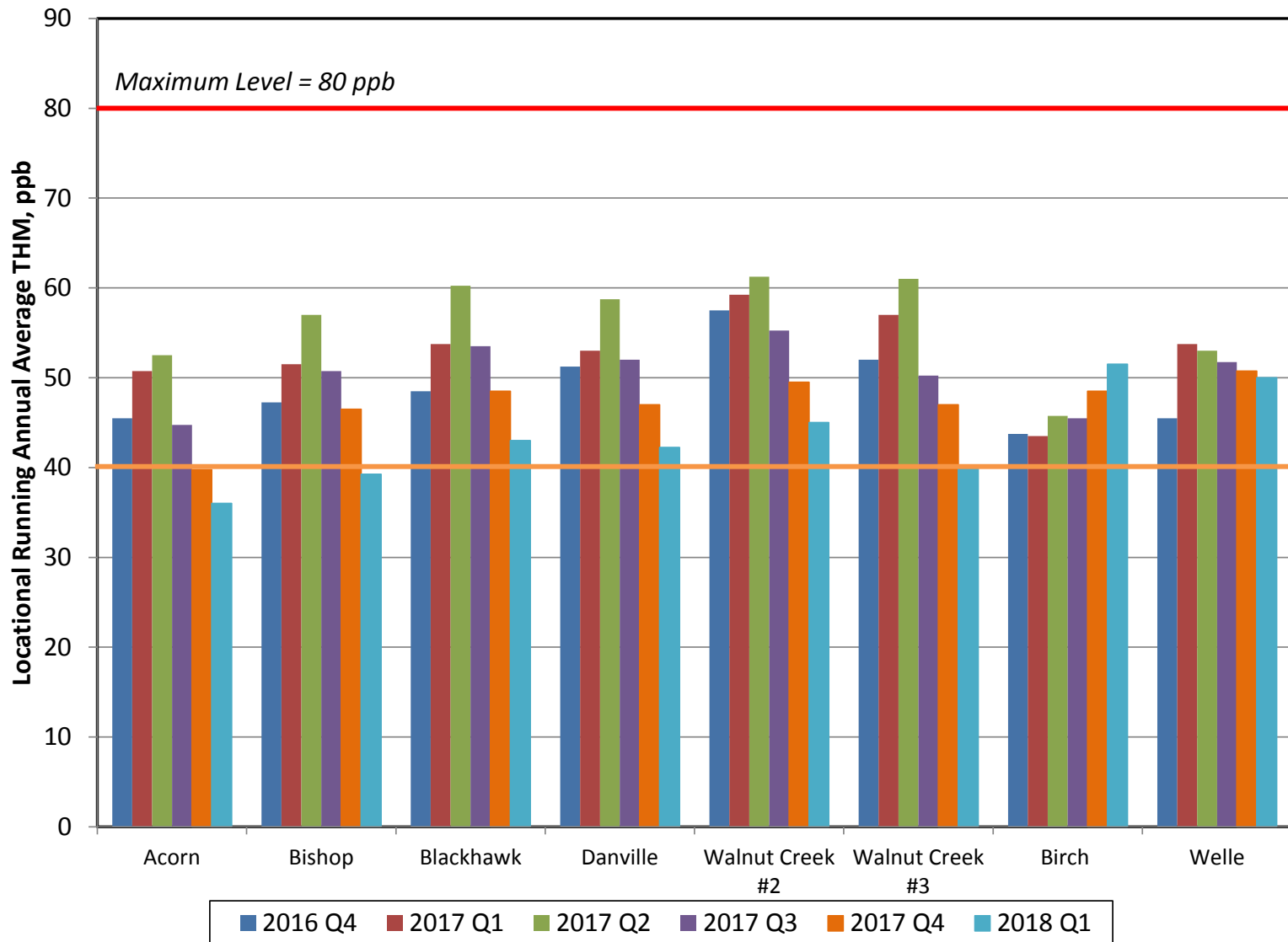
- The District strives to meet all internal water quality goals (more stringent than standards)
- For calendar year 2017, 94% of goals were met, 7 were exceeded
  - THMs, HAAs, NDMA
  - Four filtered water turbidity goals

# Trihalomethanes (THMs) and Haloacetic Acids (HAAs)

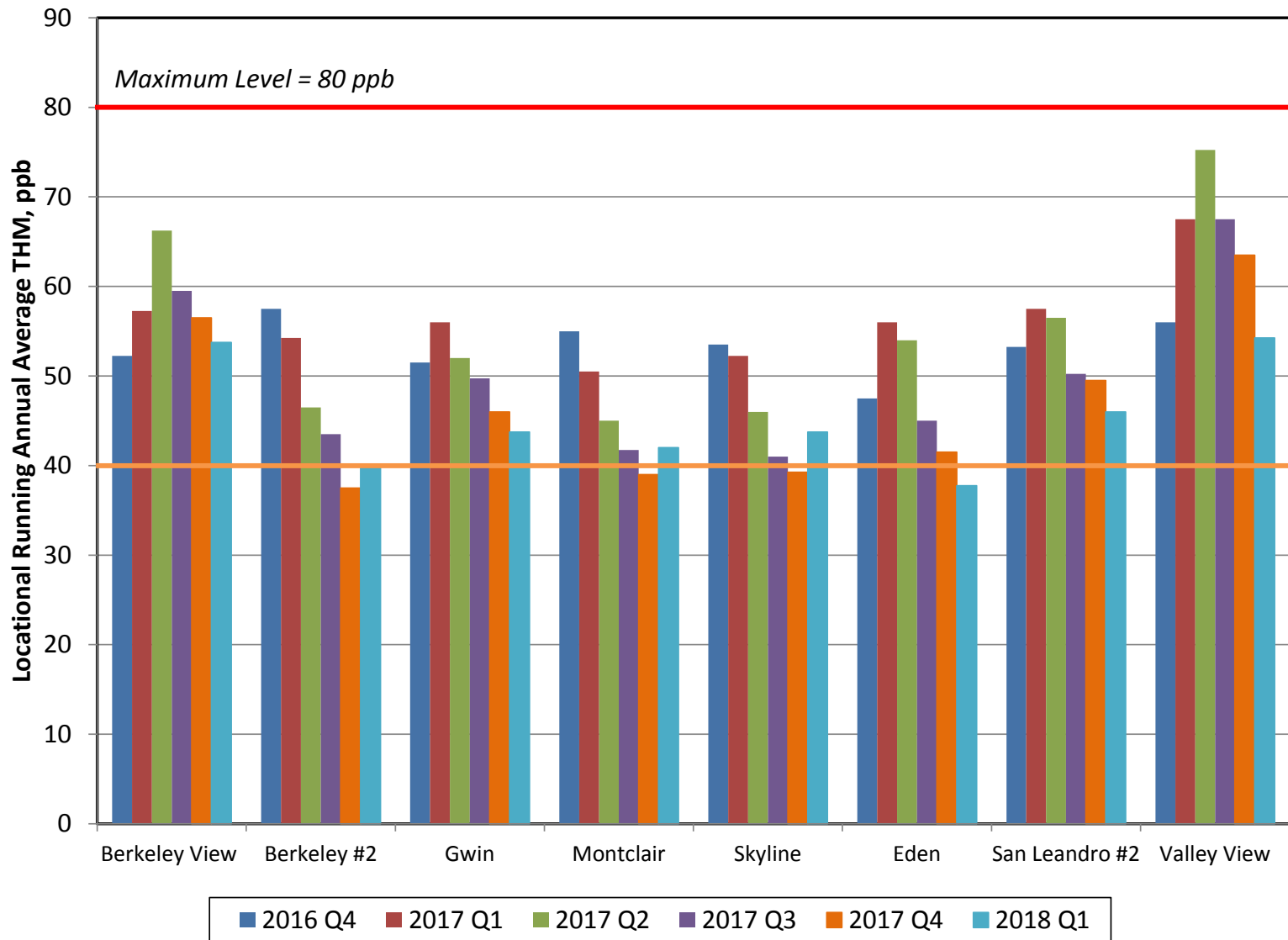


- Disinfection byproducts are formed when free chlorine is in contact with organic matter in water
  - THMs: 60 of 64 samples exceeded goal
  - HAAs: 46 of 64 samples exceeded goal
- High runoff into Pardee watershed after years of drought elevated precursor material
- High chlorine doses needed due to warmer temperatures and long residence times in system
- Operational changes and improving raw water quality have resulted in lower values
- Upcoming capital projects will lower levels further

# Trihalomethanes (THMs) – 1 of 2



# Trihalomethanes (THMs) – 2 of 2



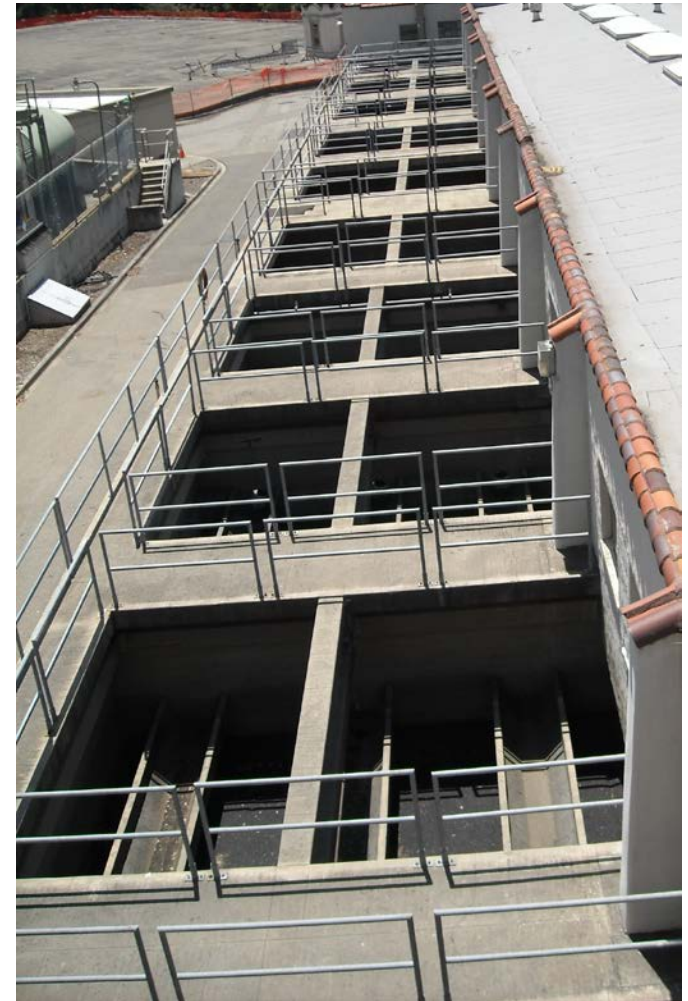
# N-nitrosodimethylamine (NDMA)



- Usually a byproduct formed by chloramine
- 9 of 20 samples exceeded goal
- NDMA is not currently regulated, District goal is set at the California Public Health Goal
- NDMA is not likely to be regulated in the near future due to expected low public health risk from drinking water
- Formation time is long; efforts to reduce water age in distribution system also help reduce NDMA
- Continue to monitor and participate in research

# Filtered water turbidity

- Turbidity is an indication of the performance of the filters at the treatment plants
- 5 goals pertaining to the percent of time an individual filter or combination of filters has elevated turbidity readings, 4 were not met
- Goal is 100% of readings,  $<0.01\%$  did not meet targets
- Attributed to mechanical, control system, and chemical dosing issues
- Not indicative of ongoing problems



*Sand and anthracite filters at WTP*





- Lead & Copper Rule tap sampling for regulatory compliance in 2017
  - Action Level is 15 ppb for 90<sup>th</sup> percentile
  - District's 90<sup>th</sup> percentile was 3 ppb
- Free customer tap sampling program (vouchers)
  - Approximately 700 requests so far
  - Approximately ½ returned
  - 90<sup>th</sup> percentile is <1 ppb

- Sampling in schools
  - On track to meet existing regulatory deadline
  - Regulations continue to evolve
- Service line inventory
  - On track to meet existing deadline
  - No known lead service lines
  - May have lead “pigtails” (short connecting pieces) which will be phased out over time
  - Data indicate corrosion control is effective



*School sampling*

# Taste and Odor

- No significant events in 2017
- Ozone systems at conventional treatment plants are being upgraded
- Construction is ongoing, ozone may not be available until May or possibly June
- Small risk of T&O event if demand is high during major algae bloom
- Mitigation measures in place to minimize T&O issues
  - Additional monitoring in lakes
  - Short-term equipment rental of activated carbon feed equipment
  - Algaecide treatment in lakes



*New ozone generator, Sobrante WTP*

# Backflow Prevention



- Backflow protection is required when alternate water sources are present on customer's property
- During 2017, cross connections were discovered between potable and non-potable supplies (irrigation wells)
- Alameda Point was most significant; health advisory issued to hundreds of homes until sample results indicated water was safe to drink
- District staff sampled, disinfected, flushed, installed backflow devices, and worked to ensure safety of water supplies



# Distribution System Quality



- Disinfectant residuals must be maintained throughout system to prevent microbial contamination
- Long residence times in some areas make this difficult
- Reservoirs are removed from service, either seasonally or permanently, whenever possible subject to emergency storage requirements
- Capital projects (replace over-sized reservoirs, install dual tanks, regulate and/or pump to improve circulation) will help improve water quality



*Sampling Station*



# Questions?



# **2017 Mokelumne River Salmon Return Update**

April 10, 2018

Planning Committee Meeting

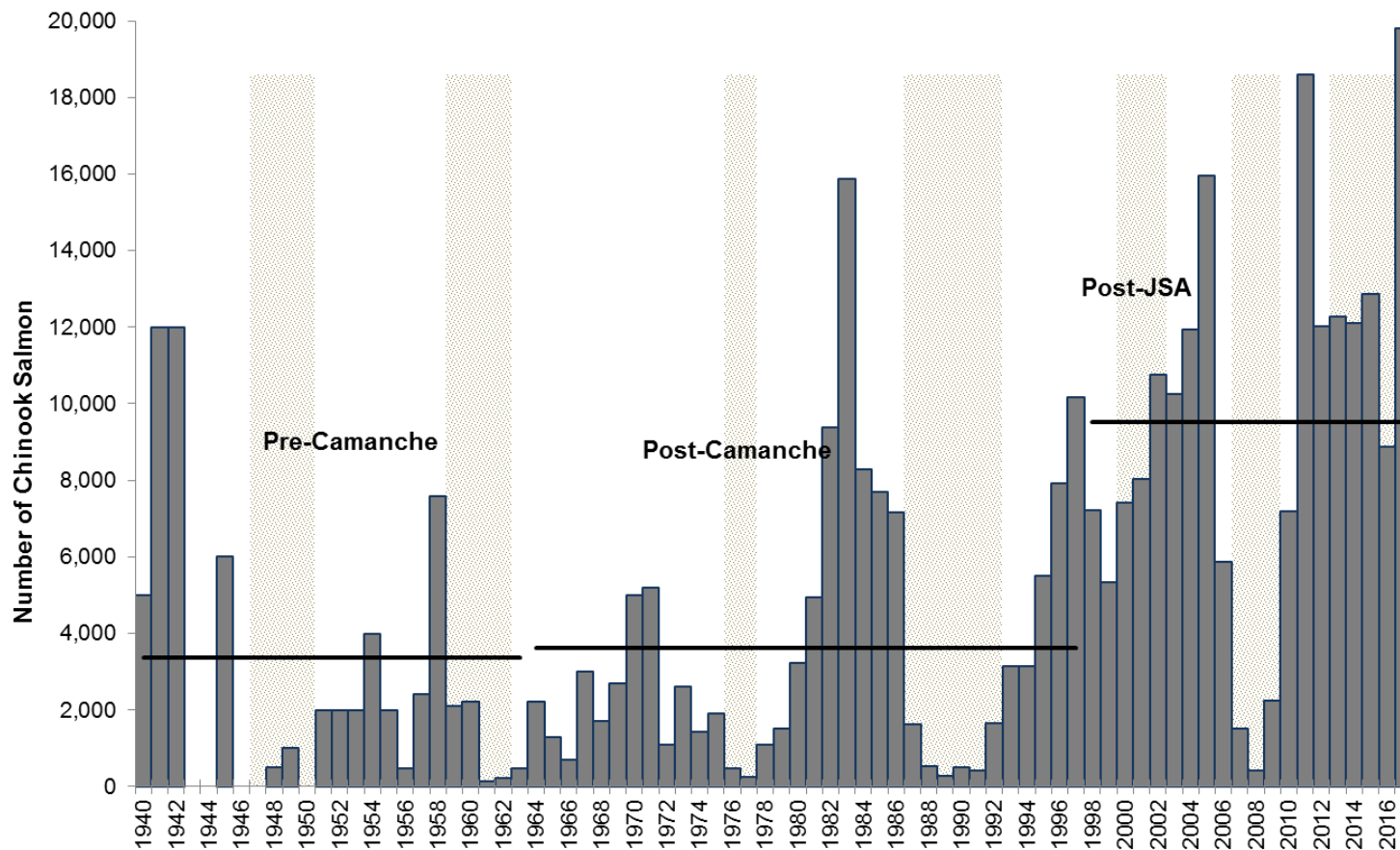
# Overview



- **2017 Salmon Returns**
- **Central Valley Salmon**
- **Ocean Recoveries**
- **Media Day**



# Historical Salmon Count



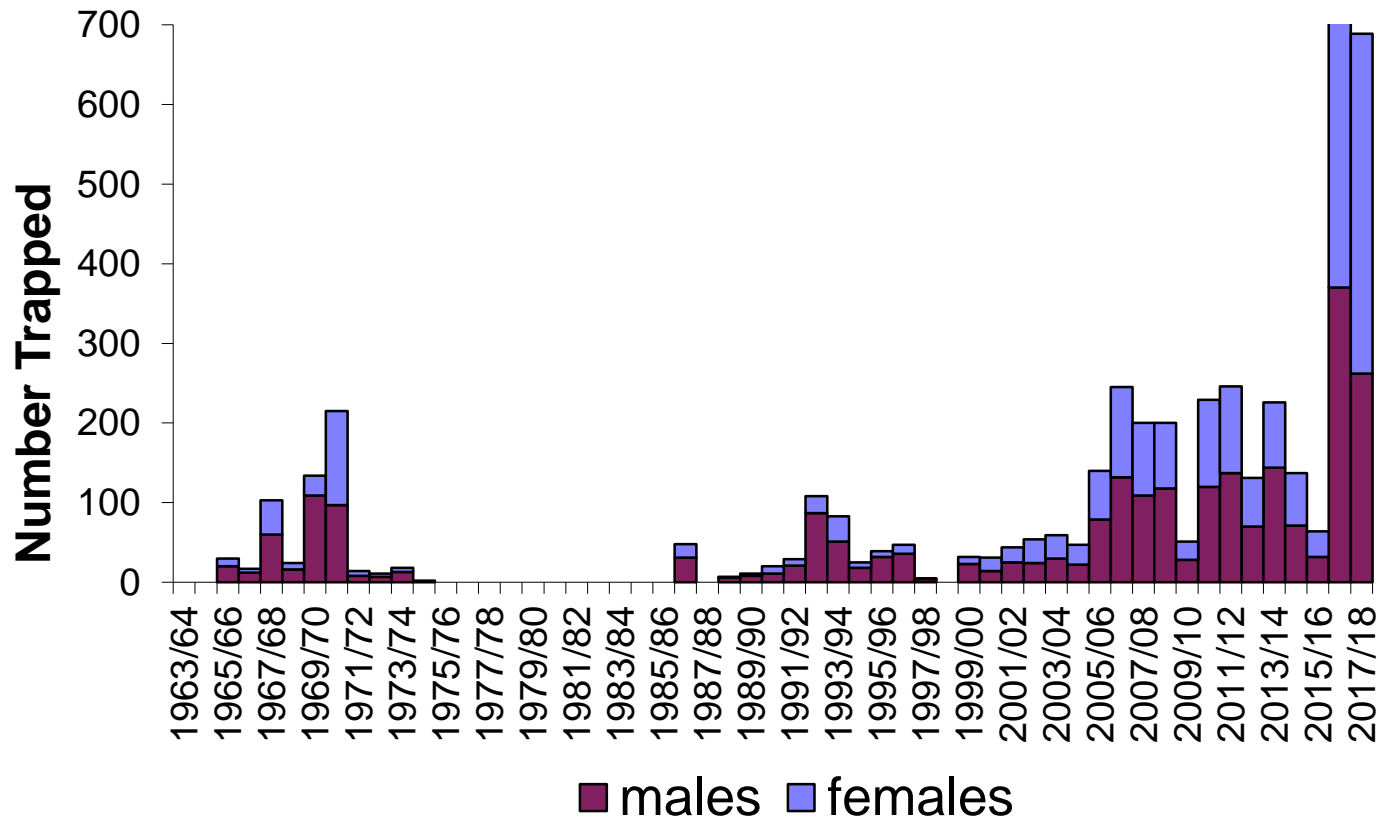
Horizontal lines indicate pre-Camanche, post-Camanche, and post-JSA periods, respectively.

1. "Pre-Camanche" escapement (3,374) is the average estimate at Woodbridge Dam for the period from 1940 through 1963 (excluding years when no data were recorded: 1943, 1944, 1946, 1947, and 1950).
2. "Post-Camanche" escapement (3,636) is the average estimate at Woodbridge Dam for the period 1964 through 1997.
3. "Post-JSA" escapement (9,000) is the average estimate at Woodbridge Dam since implementation of the JSA in 1998.
4. Dithered shaded areas are periods of drought in California. Historical drought data are based on California Department of Water Resources, *California's most Significant Droughts: Comparing Historical and Recent Conditions*, February 2015.

# Mokelumne River Steelhead Annual Hatchery Trapping Summary



**Mokelumne Fish Hatchery Steelhead (>16") Returns (1964 to present)**

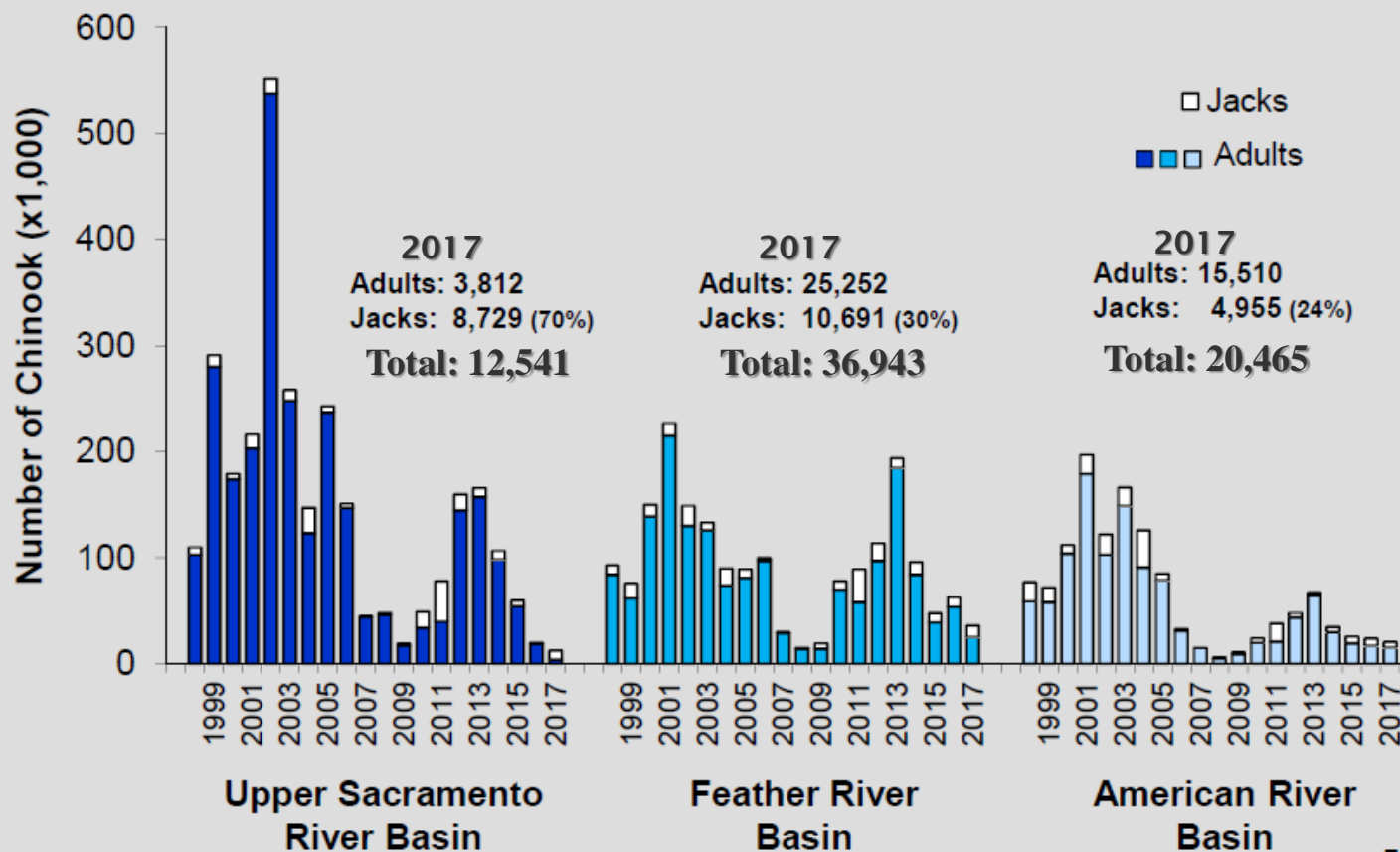




# Sacramento River Basin



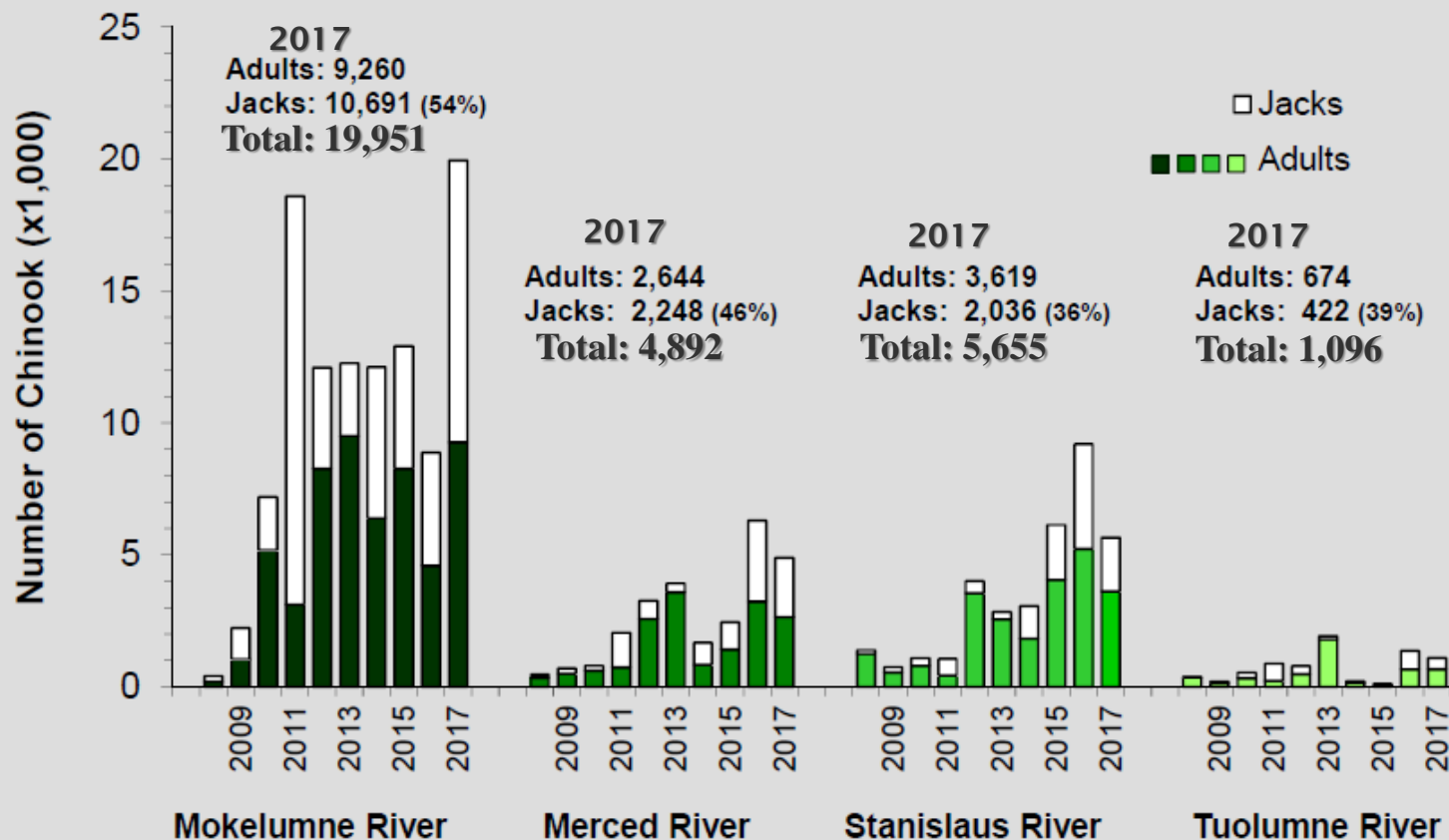
## Sacramento River Fall Chinook Adult & Jack Spawning Escapement By Basin, 1998-2017



# San Joaquin River Basin



## San Joaquin River Fall Chinook Adult & Jack Spawning Escapement By Basin, 2008-2017



# Ocean Fisheries



## Hatchery Contribution to 2017 CA Ocean Fisheries

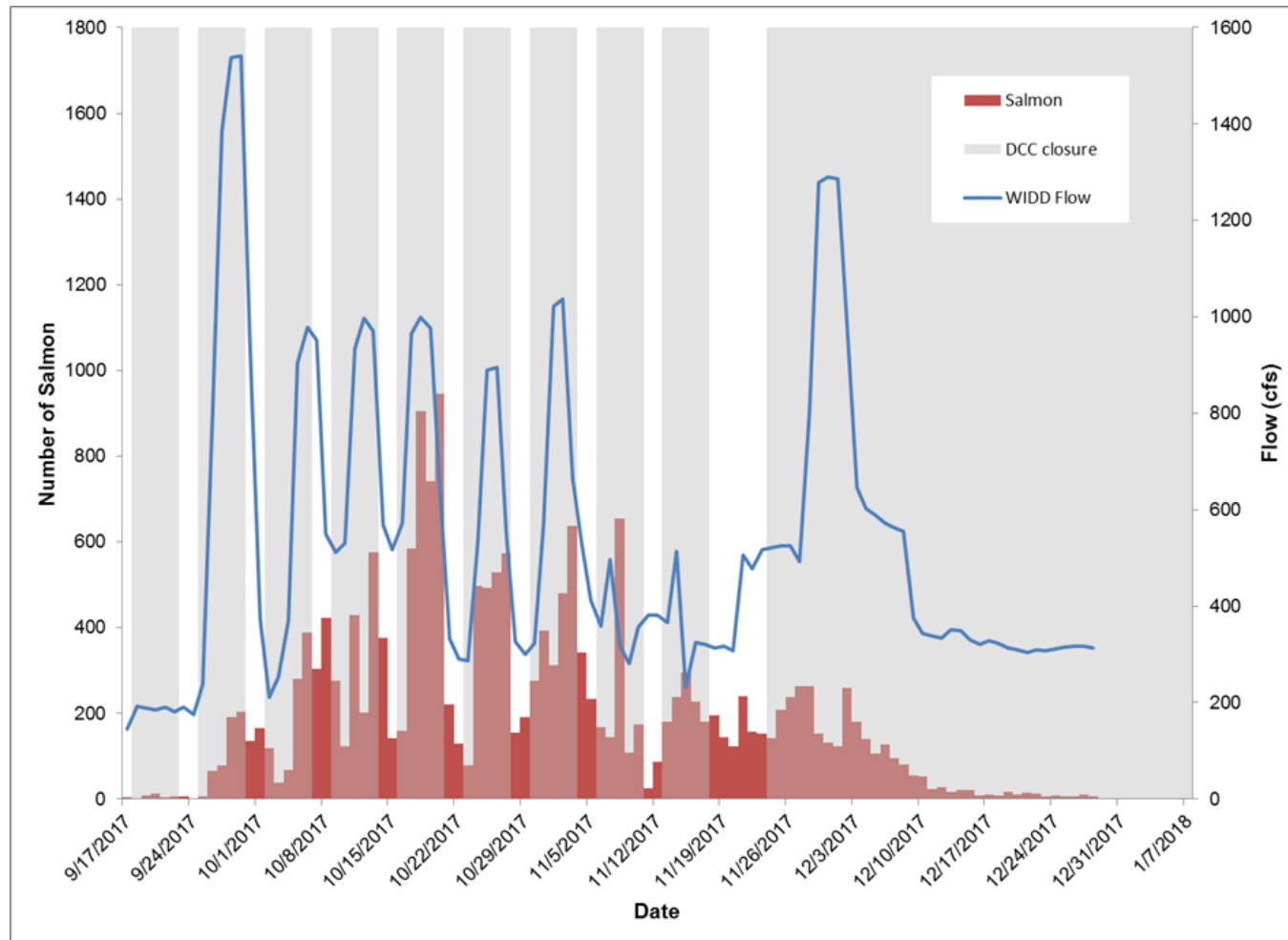
Hatchery Chinook Stock	Recreational	Commercial
<b>San Joaquin River Fall (primarily Moke)</b>	<b>35%</b>	<b>20%</b>
<b>Sacramento River Fall</b>	<b>62%</b>	<b>78%</b>
Specific Sac Trib Contributions		
<i>Feather</i>	36%	36%
<i>Coleman</i>	15%	27%
<i>Nimbus</i>	12%	16%



# Pulse Flows & DCC Closures



- Timed first pulse to precede SJR Trib pulses
- Delta Cross Channel Closures



# Barging Study

## Preliminary Results 2015 - 2017 Returns

- 3 year study
- MRFH Fish
- 100% Tagged
- 100K fish per year
- Proof of Concept

Method	Mokelumne Recoveries	American and Feather Recoveries	SJ Recoveries	Ocean Recoveries
In-River	2	9	0	5
Trucked	30	93	8	664
Barged	192	267	25	853







# 2018 Issues



- Restricted ocean season could further improve salmon returns
- Attraction pulse flows and advocacy for favorable DCC operations
- Bay Delta Water Quality Control Plan Agreement
- Continued Tracking of Waterfix Project



# Questions



# **Natural Resource Department Public Recreation Management**

Planning Committee  
April 10, 2018

- Discuss Mokelumne and East Bay Recreation Programs
- Review Results vs. Key Performance Indicators
- Discuss Major Activities and Initiatives in 2017



# Mokelumne Watershed Recreation



- Four developed Recreation Areas plus over 35 miles of trail
- Around 500,000 visitors in a typical year
- Implementing recommendations from Mokelumne Watershed Recreation Management Plan (2010)
- KPIs established for cost recovery, safety and visitor satisfaction

# Mokelumne Recreation Visitation



Management Area	2013	2014	2015	2016	2017
Camanche North Shore	193,050	170,525	147,726	192,660	242,036
Camanche South Shore	189,360	168,291	164,264	211,040	254,378
Pardee Recreation	71,558	66,769	48,140	57,224	89,926
Mokelumne River Day Use	58,242	60,753	53,520	64,252	55,233
Camanche Hills Hunting Preserve	12,962	13,262	12,768	12,498	12,610
Mokelumne Trails	7,838	8,462	8,259	9,417	9,519
<b>Total Visitation</b>	<b>533,010</b>	<b>488,062</b>	<b>434,677</b>	<b>547,091</b>	<b>663,702</b>

# Mokelumne Recreation Financial KPIs



<b>Recreation Management Area And % Cost Recovery (CR) Target</b>	<b>FY13 CR</b>	<b>FY14 CR</b>	<b>FY15 CR</b>	<b>FY16 CR</b>	<b>FY17 CR</b>
Camanche Northshore: 45%	66%	66%	67%	54%	64%
Camanche Southshore: 45%	64%	64%	63%	63%	54%
CHHP: 95%	96%	93%	87%	94%	100%
Pardee Recreation: 40%	41%	40%	45%	34%	46%

# Mokelumne Recreation Public Safety



<b>RMP Goal</b>	<b>2013 Result</b>	<b>2014 Result</b>	<b>2015 Result</b>	<b>2016 Result</b>	<b>2017 Result</b>
<b>Boating Safety</b> <b>&lt;.01%</b>	.019% 5 Accidents 26,713 Vessels	.005% 1 Accident 20,461 Vessels	.00% 0 Accidents 18,223 Vessels	.011% 3 Accidents 28,130 Vessels	.011% 4 Accidents 36,918 Vessels
<b>Visitor Incidents</b> <b>&lt;.2%</b>	.12% 634 Incidents 523,121 Visitors	.06% 294 Incidents 487,361 Visitors	.06% 273 Incidents 434,360 Visitors	.04% 207 Incidents 547,055 Visitors	.04% 243 Incidents 663,702 Visitors

# Mokelumne Recreation Customer Surveys



- Visitor surveys include request for feedback on Courtesy, Cleanliness, Value, Safety and Security
- Target rating is minimum 80% "Good" or "Excellent"
- 2014 results: 93%
- 2015 results: 95%
- 2016 results: 95%
- 2017 results: 95%

**HOW ARE WE DOING?**

Please rate the following regarding your most recent experience at Pardee Reservoir. Please email additional comments to [recreate@ebmud.com](mailto:recreate@ebmud.com). 2/10/8

Date of visit 4/17/17

	EXCELLENT	GOOD	ONLY FAIR	POOR	NO EXPERIENCE
Courtesy and helpfulness of staff	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleanliness of location and facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value for services provided	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety/Security of recreation area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of information/signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall satisfaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How can we improve? NOT MUCH ROOM FOR IMPROVEMENT. VERY CLEAN, EXCELLENT LANDSCAPING.

Optional- City/State of Residence: \_\_\_\_\_

Age: ☐ Under 35 ☐ 36 - 50 ☐ 51-60 ☒ Over 60 Gender: ☐ F ☒ M

**HOW ARE WE DOING?**

Please rate the following regarding your most recent experience at Camanche Sout Shore. Please email additional comments to [recreate@ebmud.com](mailto:recreate@ebmud.com).

Date of visit 10/11/2017

	EXCELLENT	GOOD	ONLY FAIR	POOR	NO EXPERIENCE
Courtesy and helpfulness of staff	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleanliness of location and facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value for services provided	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety/Security of recreation area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of information/signage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall satisfaction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How can we improve? Tell some people to clean everything. Hope that will help to keep it clean.

Optional- City/State of Residence: Holland visitors!!

Age: ☐ Under 35 ☐ 36 - 50 ☐ 51-60 ☐ Over 60 Gender: ☐ F ☐ M



# Mokelumne Recreation Projects and Initiatives



## **NOTICE**

Due to Extremely Hazardous Conditions  
**River Access for Launching Vessels  
Has Been Closed**  
at the Mokelumne River Day Use Area

This closure will be in place until further notice.



- Staff worked with SJ County partners to close river access for launching below Camanche for six months due to high flows and hazardous conditions
- Quagga/Zebra Mussel Inspection Program Completes 10<sup>th</sup> Successful Year

# Mokelumne Recreation Projects and Initiatives (cont.)



- Rocky Mountain Recreation Company Begins 5-Year Contract at Pardee Recreation Area



- Boat Restraining Barrier replaced at Camanche Reservoir

# Mokelumne Recreation Projects and Initiatives (cont.)



- Children's Fishing Pond De-watered to Address Invasive Species.



- Camanche Moccasin Campground Improvements



# Mokelumne Recreation Projects and Initiatives (cont.)

## Maintenance/Capital Improvement Fund



- Camanche South Shore Marina Parking Lot Re-paved



- Camanche North Shore Open Berth Dock Refurbished

# East Bay Watershed Recreation



- Two developed recreation areas and nearly 90 miles of trails
- Over 1.2 million visitors in a typical year
- Venue for 3 collegiate crew rowing teams and host of 4 amateur rowing events drawing over 3,000 spectators
- KPIs established for cost recovery, safety and visitor satisfaction



# East Bay Recreation Public Safety



		RESULTS				
<u>KPI</u>	<u>GOAL</u>	<u>CY 2013</u>	<u>CY 2014</u>	<u>CY 2015</u>	<u>CY 2016</u>	<u>CY 2017</u>
Visitor Incidents *	.2%	.02%	.02%	.03%	.03%	.04%
		278 Incidents	281 Incidents	403 Incidents	371 Incidents	447 Incidents
		1,116,031 visitors	1,166,555 visitors	1,263,651 visitors	1,292,700 visitors	1,227,300 visitors

\*Number of documented visitor incidents per visitor day

# East Bay Recreation Customer Surveys



- 2014 results: 100% of responses “Good” or “Excellent”
- 2015 results: 94% of responses “Good” or “Excellent”
- 2016 results: 92% of responses “Good” or “Excellent”
- 2017 results: 89% of responses “Good” or “Excellent”



# East Bay Watershed Recreation Visitation



Location	CY 2015	CY 2016	CY 2017
Lafayette Recreation Area	1,106,994	1,080,662	1,003,287
San Pablo Recreation Area	153,395	140,638	137,513
Trail System	68,300	71,140	86,500
Total	1,328,689	1,292,440	1,227,300

# East Bay Watershed Recreation Revenue



Location	CY 2015	CY 2016	CY 2017
Lafayette Recreation Area	\$1,302,658	\$1,321,629	\$1,284,738
San Pablo Recreation Area	\$827,252	\$884,155	\$844,308
Watershed Trails	\$53,880	\$58,180	\$62,960
Total	\$2,183,790	\$2,263,964	\$2,192,006

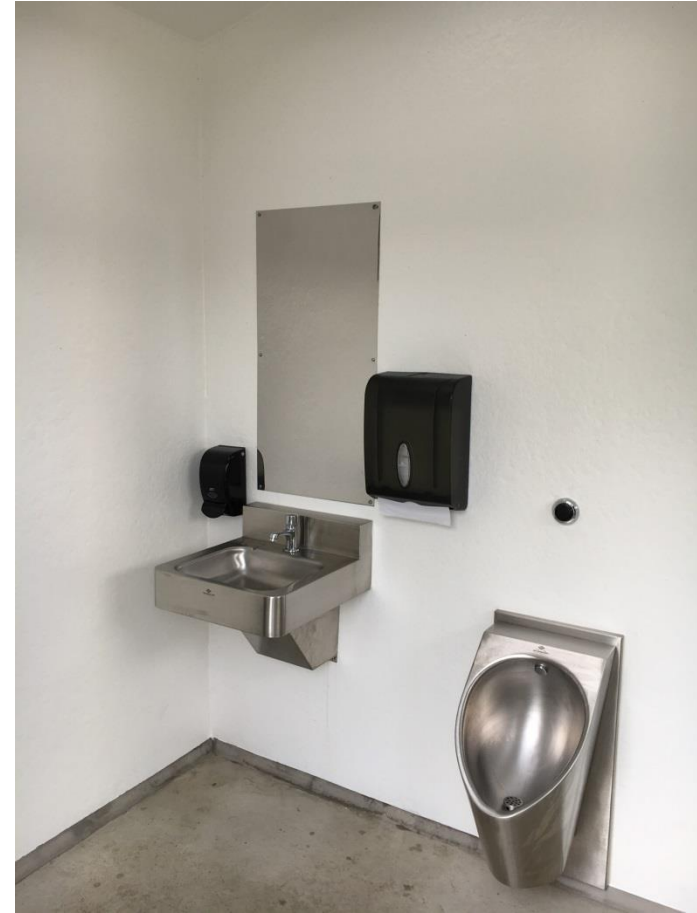
# East Bay Recreation Financial KPIs



<b>Recreation Management Area</b>	<b>FY 2014 Actual</b>	<b>FY 2015 Actual</b>	<b>FY 2016 Actual</b>	<b>FY 2017 Actual</b>
<b>% Cost Recovery Target</b>				
Lafayette Recreation Management Area: 65%	84%	82%	79%	79%
San Pablo Recreation Management Area: 40%	54%	50%	57%	55%



# East Bay Recreation Projects and Initiatives



New, upgraded restroom facility at Lafayette Reservoir.



# East Bay Recreation Projects and Initiatives



New patio at the Visitor  
Center at Lafayette Reservoir



Workout stations installed  
at Lafayette Reservoir



# East Bay Recreation Projects and Initiatives



Trail resurfacing

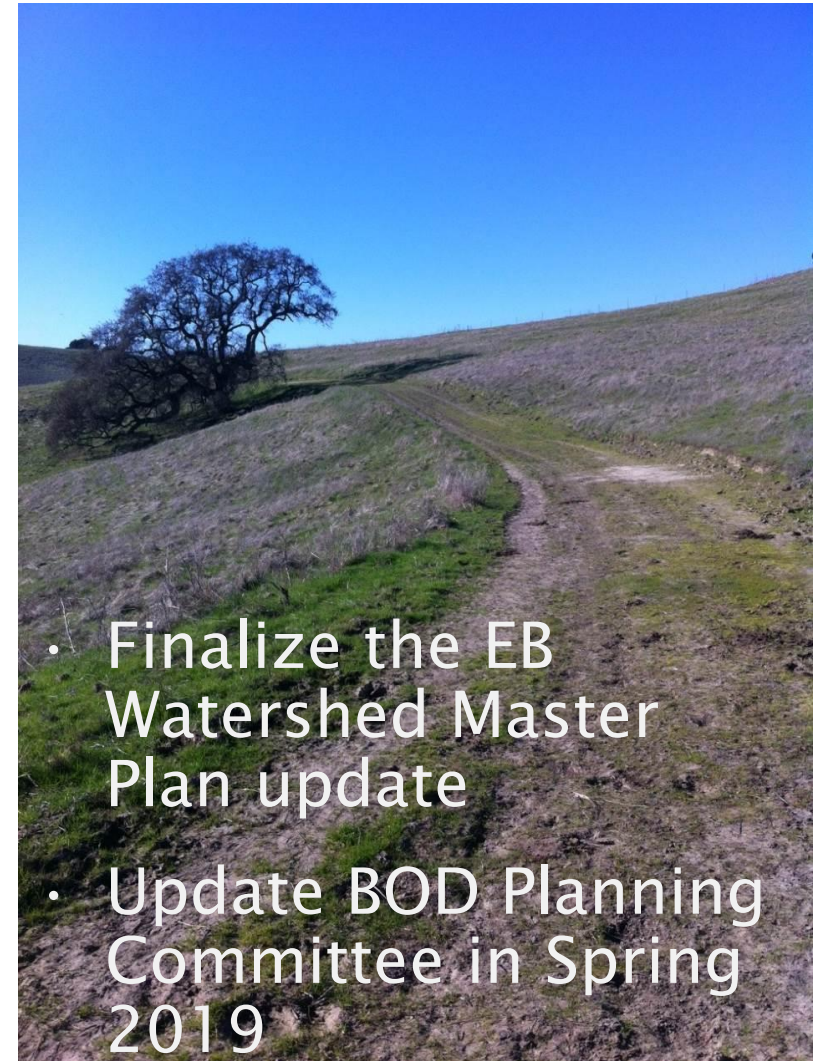


Sewage lift station  
replacement



# Next Steps

- Completion of the 1990 Camanche Plan
- Successful first year for Rocky Mountain Recreation at Pardee
- Address challenges at unstaffed recreation sites



- Finalize the EB Watershed Master Plan update
- Update BOD Planning Committee in Spring 2019

