

# ***WELCOME!***

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# AGENDA

- Welcome
  - Thank You Sponsors
  - Panel Discussion
  - Close
- 

**Welcome!**



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# Panel Discussion



# MODERATOR



**Mahsa Shayan, Ph.D.,  
P.Eng.**

PFAS Practice Lead  
Cape Environmental  
Management Inc.  
Orange County, California  
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Email: [mshayan@cape-inc.com](mailto:mshayan@cape-inc.com)

- Professional and academic experience in environmental site characterization and remediation
- Specialized in contaminant fate and transport analyses, conceptual site model development, feasibility studies, and remedial systems evaluation/optimization.
- CAPE's PFAS Practice Lead, June 2023- Present
- AECOM's Global PFAS Technical Practice Group Lead, 2020-2023
- AECOM's Canada Region PFAS Lead, 2017-2020
- Member of ITRC PFAS Team, SAME Environment COI, PFAS Industry-Government Engagement (IGE), Director of SAME OC Post Golf Tournament
- Ph.D., Civil/Environmental Engineering, University of Waterloo, Canada, 2015
- Postdoctoral Fellowship, Earth Sciences, University of Toronto, Canada, 2017







## Panel Discussion:

# Impacts of PFAS on Federal Entities, Local Water Utilities, and Regulatory Agencies

March 7, 2024

# PFAS IN THE MEDIA



## 'Ticking time bomb': PFAS chemicals in drinking water alarm scientists over health risks

EPA under pressure to regulate PFAS, found in the water of nearly 2,800 cities.

By [Devin Dwyer](#), [Stephanie Ebbs](#) and [Jacqueline Yoo](#)  
August 10, 2021, 12:33 PM



'Forever chemicals' detected in water systems of nearly 2,800 US cities  
ABC News' Devin Dwyer investigates the growing concern over PFAS contamination and mounting pres... [Show More](#)

# PFAS EMERGENCE/AWARENESS TIMELINE

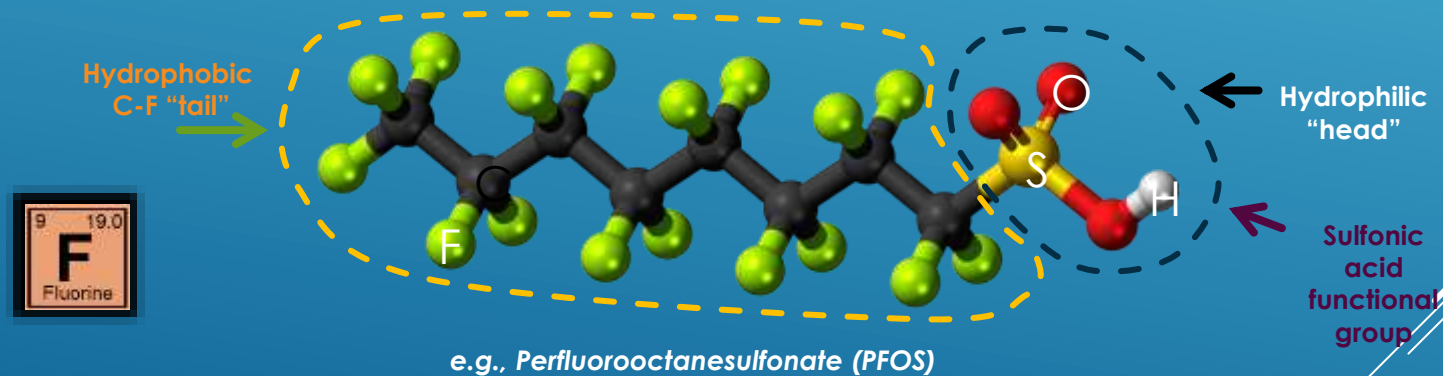


ITRC, 2023

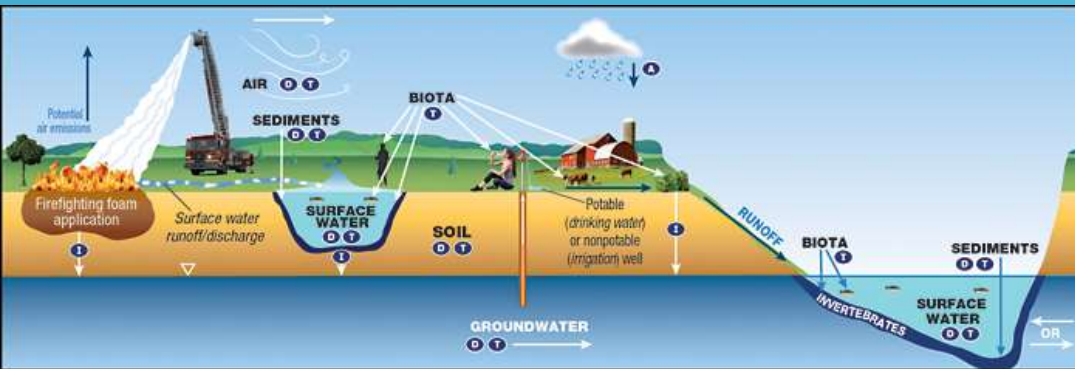
- Unique physical and chemical properties including oil, water, stain, and soil repellency, chemical and thermal stability, and friction reduction/surfactant properties.
- Applications in many industries, including the aerospace, semiconductor, medical, automotive, construction, electronics, aviation industries, consumer products (such as carpets, clothing, furniture, outdoor equipment, food packaging), and firefighting applications.
- Linked to cancer, immune, and reproductive system toxicity

# PFAS STRUCTURE: FATE & TRANSPORT BEHAVIOR

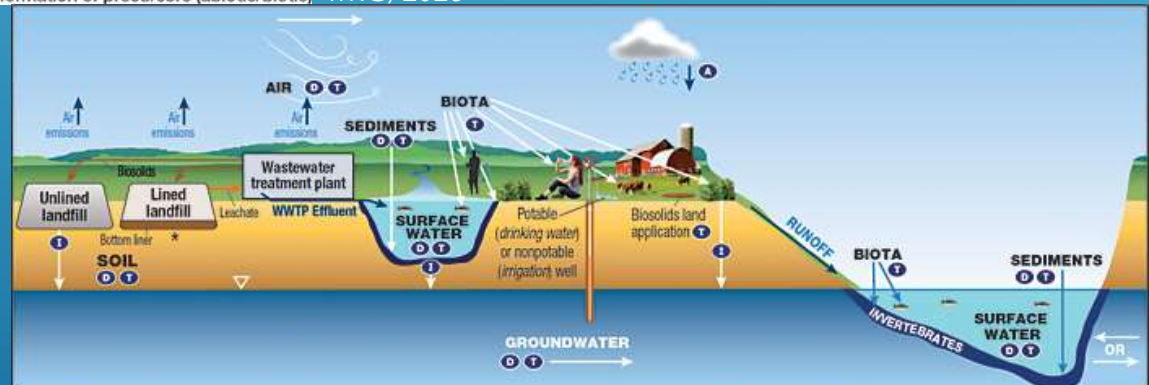
- Hydrophobic “tail” of different lengths → increasing sorption with increasing length
- Hydrophilic “head” can have different ionic charges → anionic, cationic, zwitterionic, neutral → variable solubility, volatility, sorption characteristics



# PFAS FATE & TRANSPORT



KEY A Atmospheric Deposition D Diffusion/Dispersion/Advection I Infiltration T Transformation of precursors (abiotic/biotic) ITRC, 2023



\*Leachate release from lined landfills could occur in the event of a liner leak  
KEY A Atmospheric Deposition D Diffusion/Dispersion/Advection I Infiltration T Transformation of precursors (abiotic/biotic)

# PFAS CHALLENGES

- ▶ Large **variety** of PFAS compounds unidentified
- ▶ Limited data on **F&T properties** of many PFAS
- ▶ **Complex sorption** and retention mechanisms
- ▶ **Precursor** identification, transformation pathways and impacts on sustaining plumes
- ▶ Role of **historical remedial activities** on precursors transformation to dead-end products
- ▶ Role of **co-contaminants**
- ▶ Role of **groundwater/surface water** interactions
- ▶ Role of **atmospheric transport**/subsequent deposition
- ▶ Uncertainties re. **history** of PFAS use and mass release
- ▶ Evolving **analytical** methods and **regulatory** landscape
- ▶ **Background** levels



# TODAY WE WILL HEAR ABOUT:

## Impacts of PFAS on

- ▶ **Federal Entities: NAVFAC**
  - ▶ **Local Municipalities: OCWD**
  - ▶ **Regulatory Agencies: DTSC and Santa Ana Regional Water Board**
- 



## Sophia A Lee, P.G.

Remedial Technical Manager

NAVFAC SW, EV33

Office: 619 705-5428

DSN: 705-5428

Mobile: 916 595-4713

sophia.a.lee6.civ@us.navy.mil

- ▶ Remedial technical manager and registered professional geologist for the Navy Facilities Engineering Systems Command's Southwest Region (NAVFAC SW)
- ▶ Serves as the PFAS point of contact for the NAVFAC SW Restoration Program.
- ▶ Provides technical support for multiple remediation projects, large and small, and supports groundwater remediation, fate, and transport across the Global Fleet.
- ▶ In addition to groundwater modeling, Ms. Lee has also been involved in water resources and testing in both remote and urban environments.
- ▶ Undergraduate degrees in Geology and Classical and Near Eastern Archaeology from Bryn Mawr College and Master's in Hydrological Sciences and Engineers from the Colorado School of Mines.







## **SAME Panel Discussion**

### **Impacts of PFAS on Federal Entities, Local Water Utilities, and Regulatory Agencies - Navy**

**Sophia Lee, PG**  
**Remedial Technical Manager, NAVFAC SW**

**3/8/2024**

# The Department's Big Picture on PFAS



- The presence of PFAS in the environment is a national issue due to its wide-spread use in many industrial and consumer products. The Department recognizes the importance of this issue and is committed to addressing PFAS in a deliberative, holistic, and transparent manner.
- DoD follows the existing federal cleanup law and long-standing EPA regulations for all chemicals in our cleanup program, including PFAS. DoD supports EPA working toward regulatory standards for PFAS that help ensure a consistent approach that applies to everyone.
- DoN is conducting assessments for PFAS use or potential release at 119 installations and National Guard locations and as of December 31, 2023, has completed over 90% site investigations.
- To date, DoD has obligated over \$7 billion\* for PFAS investigation and cleanup activities, however this will continue to grow as Remedial Investigations get underway

\*PFAS Task Force as of FY2022: <https://www.acq.osd.mil/eie/eer/ecc/pfas/faqs.html>

# ASN Restoration PFAS Policy



- In June 2016, ASN [EI&E] issued a policy to identify, validate and prioritize investigation locations for known or suspected releases of PFAS on base to the environment at all DON installations.
- If a known or suspected release of PFAS on base could result in exposure to, the policy requires DON to sample off- base drinking water sources within a 1-mile area down gradient of the potential release.
- Off-base drinking water sources are initially identified in the preliminary assessment, and off-base drinking water sampling can occur at any phase of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.
- Potential exposure should be re-evaluated anytime new information (including data) becomes available.



## **DON Cleanup Approach on Our Installations**

- 1) Identify source(s) of a known or suspected release**
- 2) Identify potential for exposure through drinking water**
- 3) If potential for exposure exists, DON priority is to cut off drinking water exposure**
- 4) Prioritize sites and follow the DoDs Environmental Restoration process†**
  - a. to fully investigate the release, and
  - b. determine the appropriate cleanup actions based on risk

† Reference: Defense Environmental Restoration Program, 10 U.S.C. Section 2701

# What PFAS Levels Get Used Where?

## DoN Restoration

- Utilizes EPA Regional Screening Levels (per OSD Aug 2023)
- Meant to be used to screen media other than drinking water for cleanup and disposal purposes
- Typically, much lower than used in drinking water and vary by media

## DoN Compliance and Drinking Water

- Utilizes DoD and California notification limits as established by State and Federal entities. The Department of Defense (DoD) must follow these state standards where we supply the drinking water. (OSD, Oct 2023) As of March 2023, MCLs for PFAS in California have not yet been established.
- Meant to prevent exposure through consumption of drinking water
- Typically, higher than values used for cleanup and disposal

Analyte	Soil		Groundwater	
	Project Screening Limit (mg/kg)	Project Screening Limit Reference*	Project Screening Limit (µg/L)	Project Screening Limit Reference*
PFOA	0.019	Residential Soil RSL	0.0060	Tapwater RSL
PFOS	0.013	Residential Soil RSL	0.0040	Tapwater RSL
PFHxA	3.2	Residential Soil RSL	0.99	Tapwater RSL
PFYnS	0.13	Residential Soil RSL	0.039	Tapwater RSL
PFBA	7.8	Residential Soil RSL	1.8	Tapwater RSL
PFBS	1.8	Residential Soil RSL	0.60	Tapwater RSL
PFNA	0.019	Residential Soil RSL	0.0059	Tapwater RSL
HFPO-DA	0.023	Residential Soil RSL	0.0060	Tapwater RSL

\* In accordance with DoD technical guidance (DoD, 2022, 2019), the value shown is the residential scenario RSL for soil based on a target HQ of 0.1 (EPA, 2023).

\* In accordance with DoD technical guidance (DoD, 2022, 2019), the value shown is the residential scenario RSL for tapwater based on a HQ of 0.1 (EPA, 2023).

For the purposes of off-base sampling related to Restoration concerns, **the DoD limits of combined or individual exceedances of PFOA and/or PFOS greater than the 2016 EPA HA level of 70 ppt, require immediate action to reduce exposure.**

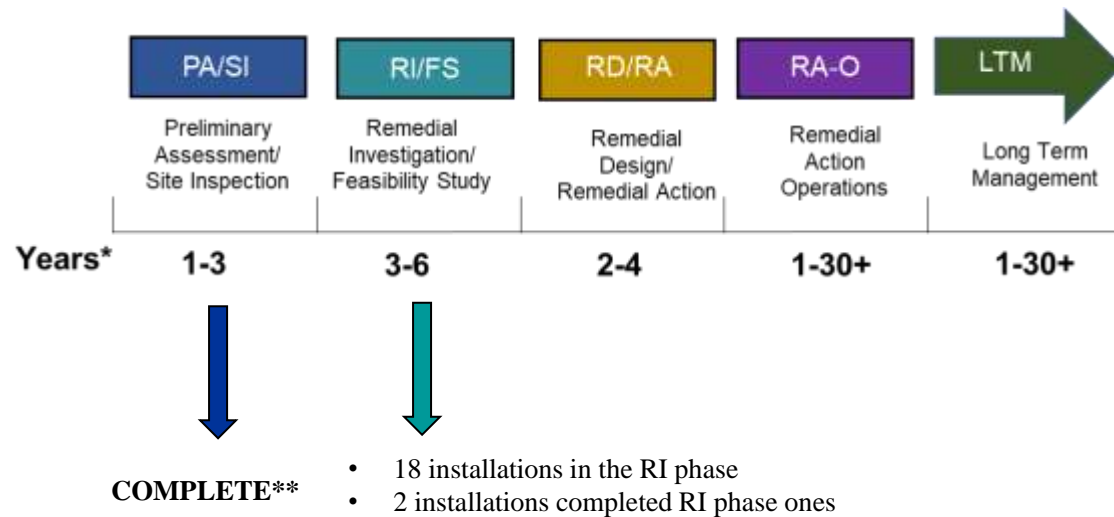
November 2023

# Summary of PFAS Standards in Drinking Water vs Groundwater



PFAS Chemical	2016 EPA Health Advisory (ppt)	2020 DOD Policy Standard (ppt)	CA Notification and Response Levels (ppt)		2023 EPA Proposed DRAFT MCLs (ppt)	Current OSD RSLs (ppt)
			(Notification Level)	(Response Level)		
PFOS	70	70	5.1	10	4	4
PFOA	70	70	6.5	40	4	6
PFNA	-	-	-	-	1.0 Hazard Index	5.9
PFHxS	-	-	3	20		39
PFBS	-	-	500	5000		600
HFPO-DA (GenX)	-	-				6

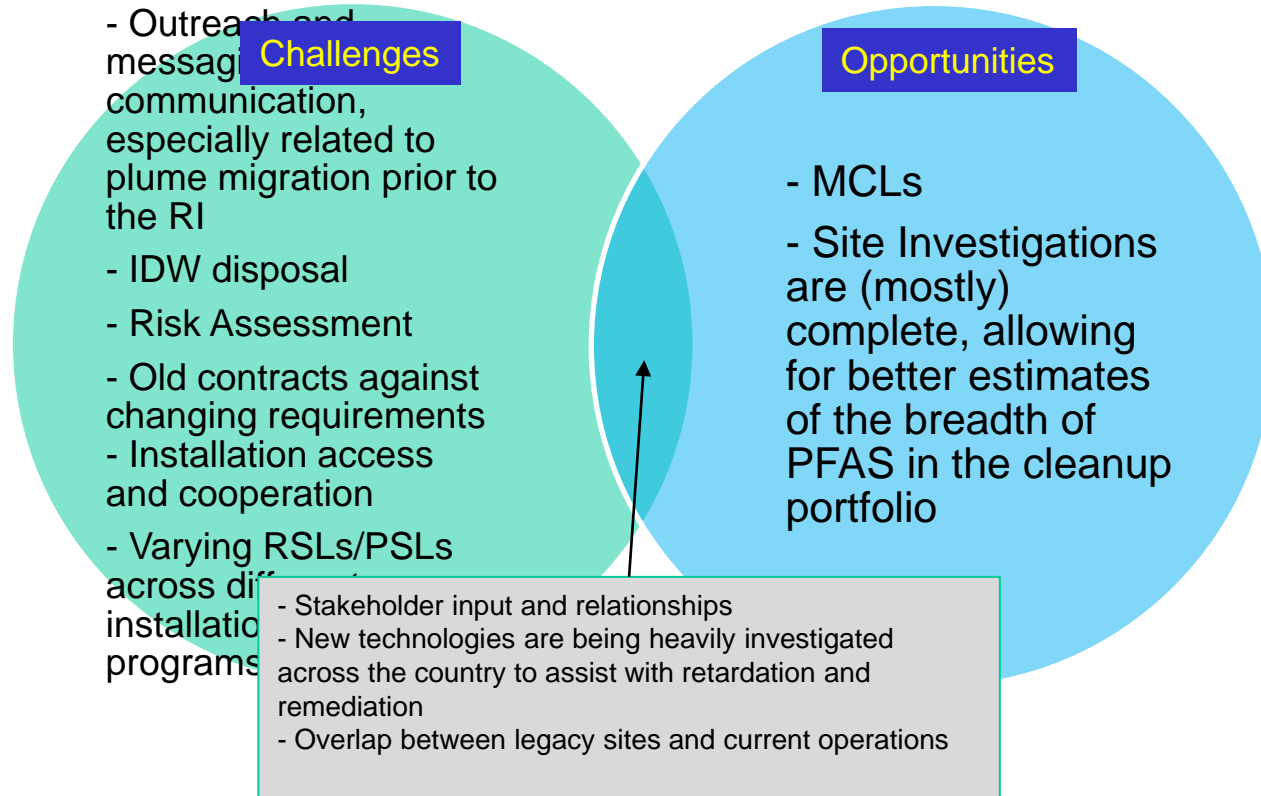
# CERCLA Process – PFAS Status SW



\*Estimated average timeframe to address installation restoration sites

\*\* Except for one installation and two detachments where sampling and results are complete and we are just awaiting reporting

# Challenges and Opportunities





# Questions

## **Mona Behrooz, P.h.D., PE**

Supervisor- Site Cleanup  
Program

Cal EPA- Santa Ana Regional  
Water Quality Control Board  
3737 Main Street, Suite 500  
Riverside, CA 92501-3348

Office: 951-782-3237

[Mehrnoosh.Behrooz@waterboards.ca.gov](mailto:Mehrnoosh.Behrooz@waterboards.ca.gov)

- ▶ Chief of the Site Cleanup Program at the Santa Ana Water Board
- ▶ Comprehensive oversight of the environmental investigation and remediation activities across a wide range of contaminated sites, from large industrial facilities to smaller operations like dry cleaners and plating facilities.
- ▶ Sites impacted by hazardous chemical discharges, including volatile organic compounds, petroleum hydrocarbons, 1,4-dioxane, PFAS, perchlorate, and chromium VI.
- ▶ Under her leadership, the Santa Ana Region is advancing seven Proposition 1 grant-funded projects, totaling approximately \$73.8 million, dedicated to planning and implementing measures to prevent impact to and clean up contamination of groundwater, thereby securing safe drinking water sources.
- ▶ Doctorate in Civil and Environmental Engineering
- ▶ California licensed Professional Civil Engineer





# **Status of PFAS Regulatory Actions in California and the Santa Ana Region**

**Mehrnoosh (Mona) Behrooz, Ph.D., P.E.**

**SAME- PEMA**

March 7, 2024

# Agenda

- State Water Resources Control Board
- Santa Ana Region Water Board
- Status of State-Wide PFAS Investigations
- Reported PFAS Impact in Santa Ana Region
- Summary
- What is Next in CA?

# Regional Water Quality Control Boards

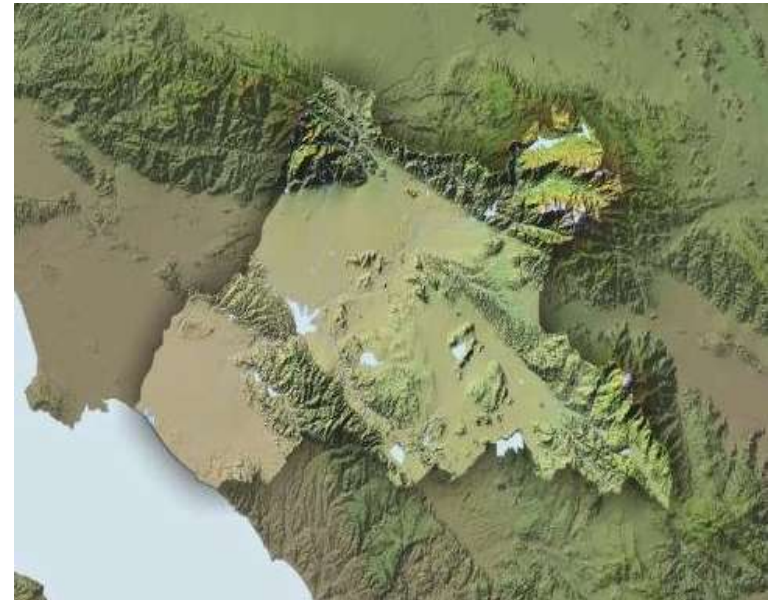


- 1 - North Coast
- 2 - San Francisco Bay
- 3 - Central Coast
- 4 - Los Angeles
- 5 - Central Valley
- 6 - Lahontan
- 7- Colorado River Basin
- 8 - Santa Ana
- 9 - San Diego



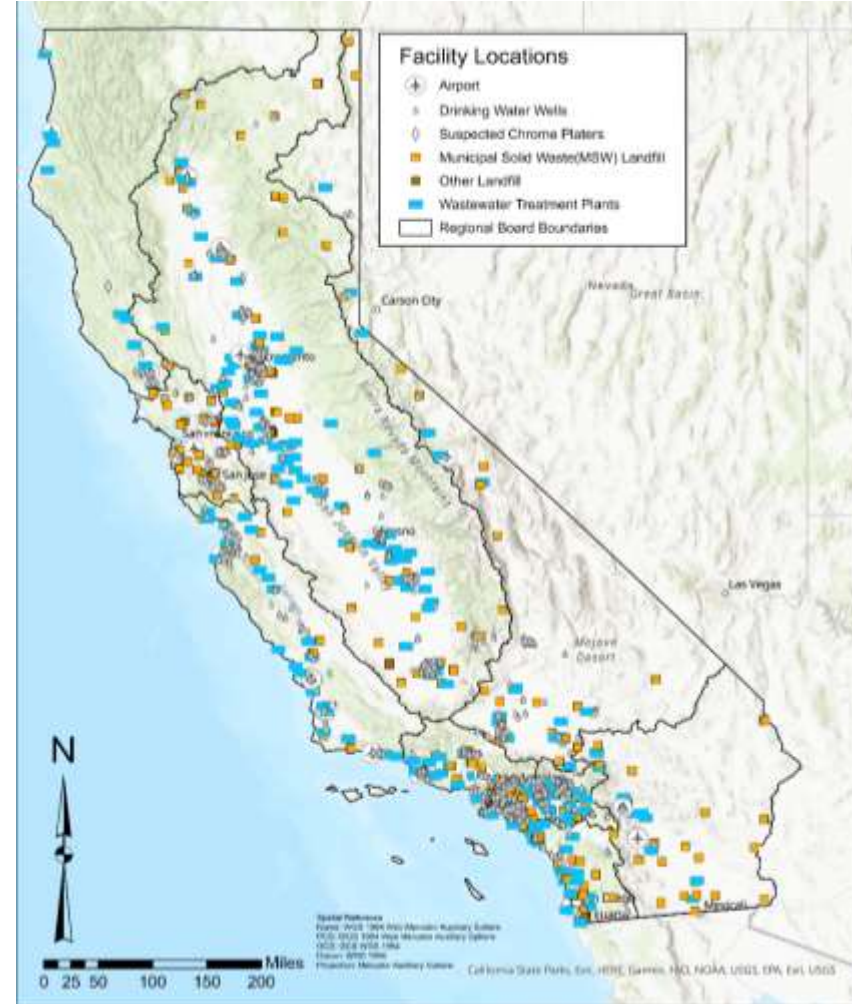
# The Santa Ana Region

- 2,800 square miles of land
- 460 miles of stream
- 21,090 acres of lakes
- 24 miles of coastline



# State-Wide PFAS Investigations

- Since 2019, investigative orders were issued to the following industries and facilities:
  - Municipal solid waste landfills (March 2019)
  - Commercial airports (March 2019)
  - Suspected chromium plating facilities (Oct. 2019)
  - Wastewater treatment plants (July 2020)
  - Refineries and bulk terminals (March 2021)
  - Drinking water supply wells operators since 2019 (Feb., June 2021 using EPA 537.1 and EPA 533)



## State Water Board Notification Levels (NLs) and Response Levels (RLs)

	Notification Level (NL) ng/L (ppt)	Response Level (RL) ng/L (ppt)	Date Issued / Status
PFOA	5.1	10	February 6, 2020
PFOS	6.5	40	February 6, 2020
PFBS	500	5000	March 5, 2021
PFHxS	3	20	October 31, 2022
PFHxA	--	--	Requested
PFHpA	--	--	Requested
PFNA	--	--	Requested
PFDA	--	--	Requested
ADONA	--	--	Requested





# EPA's Proposed Ruling for Drinking Water

	Proposed MCLG	Proposed MCL
PFOA	0	4 ppt
PFOS	0	4 ppt
PFBS	1 (HI)	1(HI)
PFHxS		
PFNA		
GenX		



# PFAS Detections Statewide and in Santa Ana River Watershed



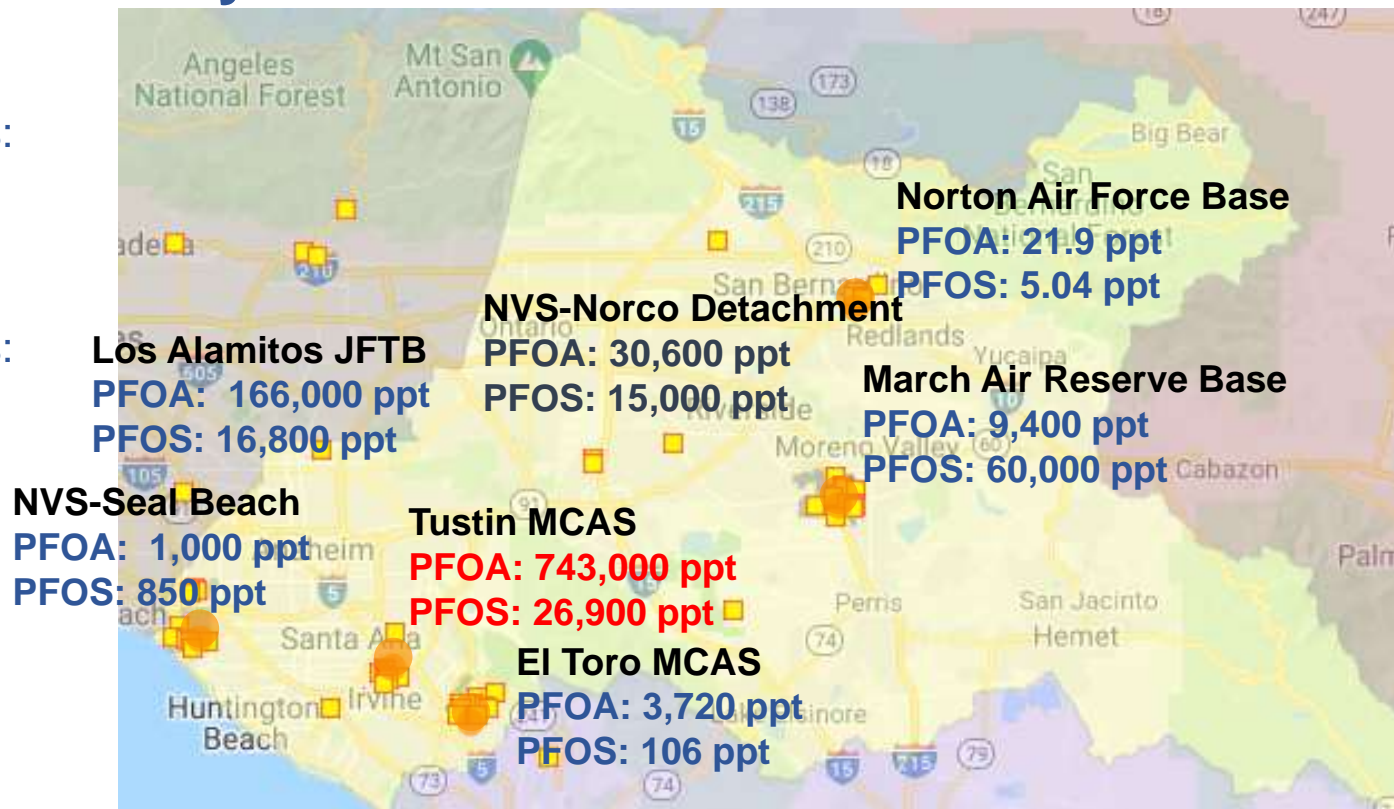
# Maximum PFOA/PFOS Detections Groundwater - Military Sites

➤ Drinking water NLs:

- PFOA: 5.1 ppt
- PFOS: 6.5 ppt

➤ Drinking water RLs:

- PFOA: 10 ppt
- PFOS: 40 ppt

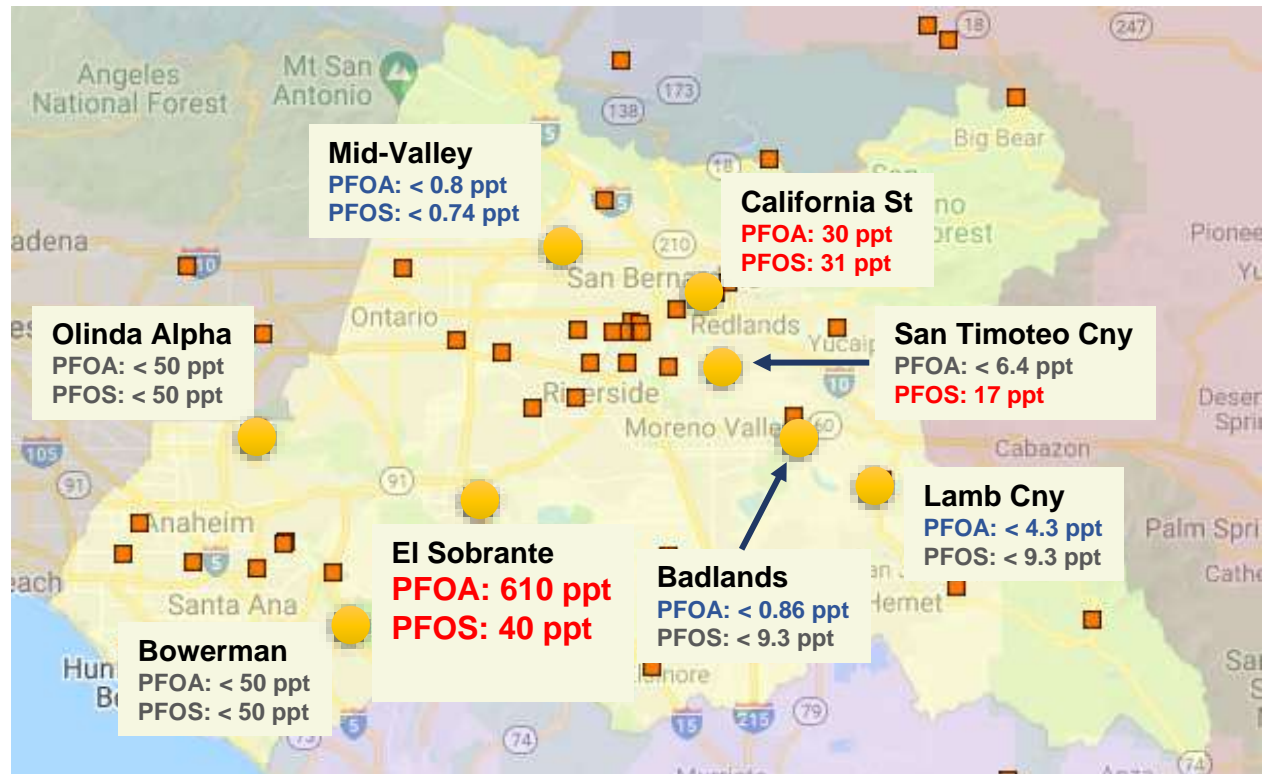


Source: GeoTracker



# Maximum PFOA/PFOS Detections Groundwater - Active Landfills

- Drinking water NLs
  - PFOA: 5.1 ppt
  - PFOS: 6.5 ppt
- Drinking water RLs
  - PFOA: 10 ppt
  - PFOS: 40 ppt

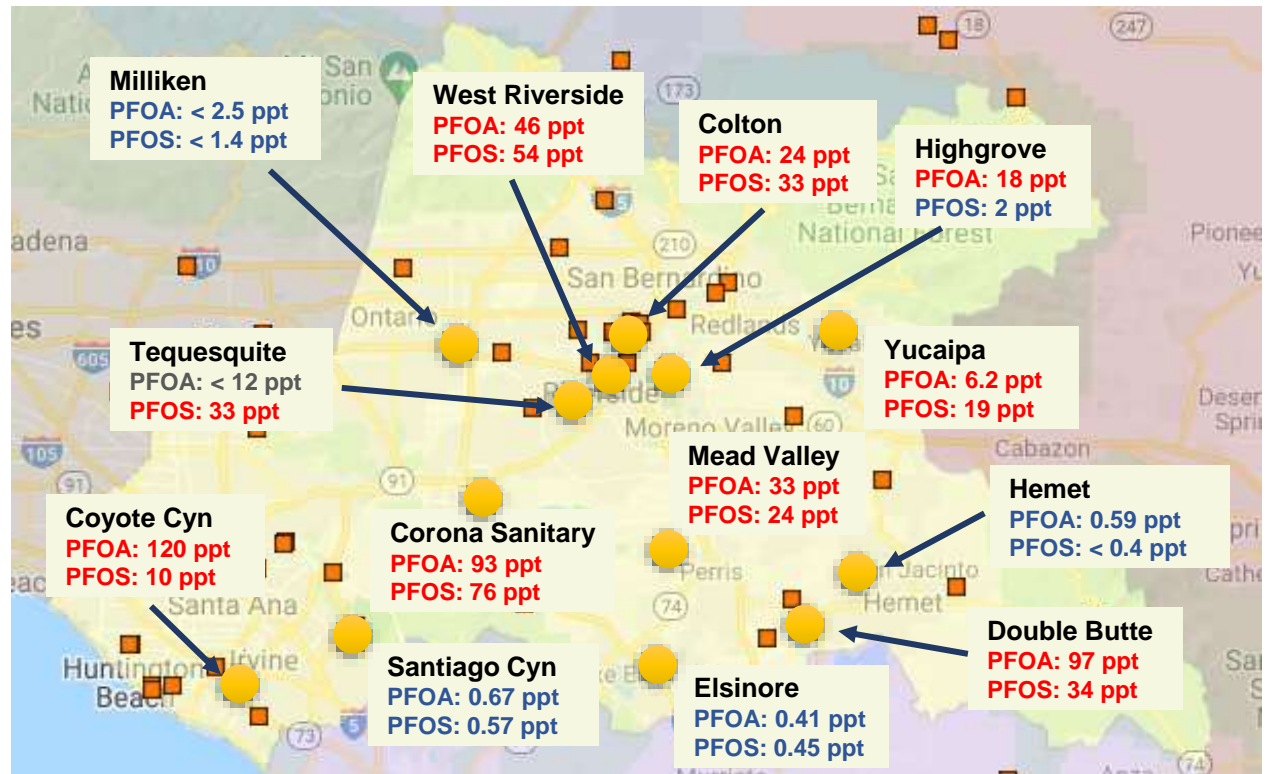


Source: GeoTracker



# Maximum PFOA/PFOS Detections Groundwater – Closed Landfills

- Drinking water NLs
  - PFOA: 5.1 ppt
  - PFOS: 6.5 ppt
  
- Drinking water RLs
  - PFOA: 10 ppt
  - PFOS: 40 ppt

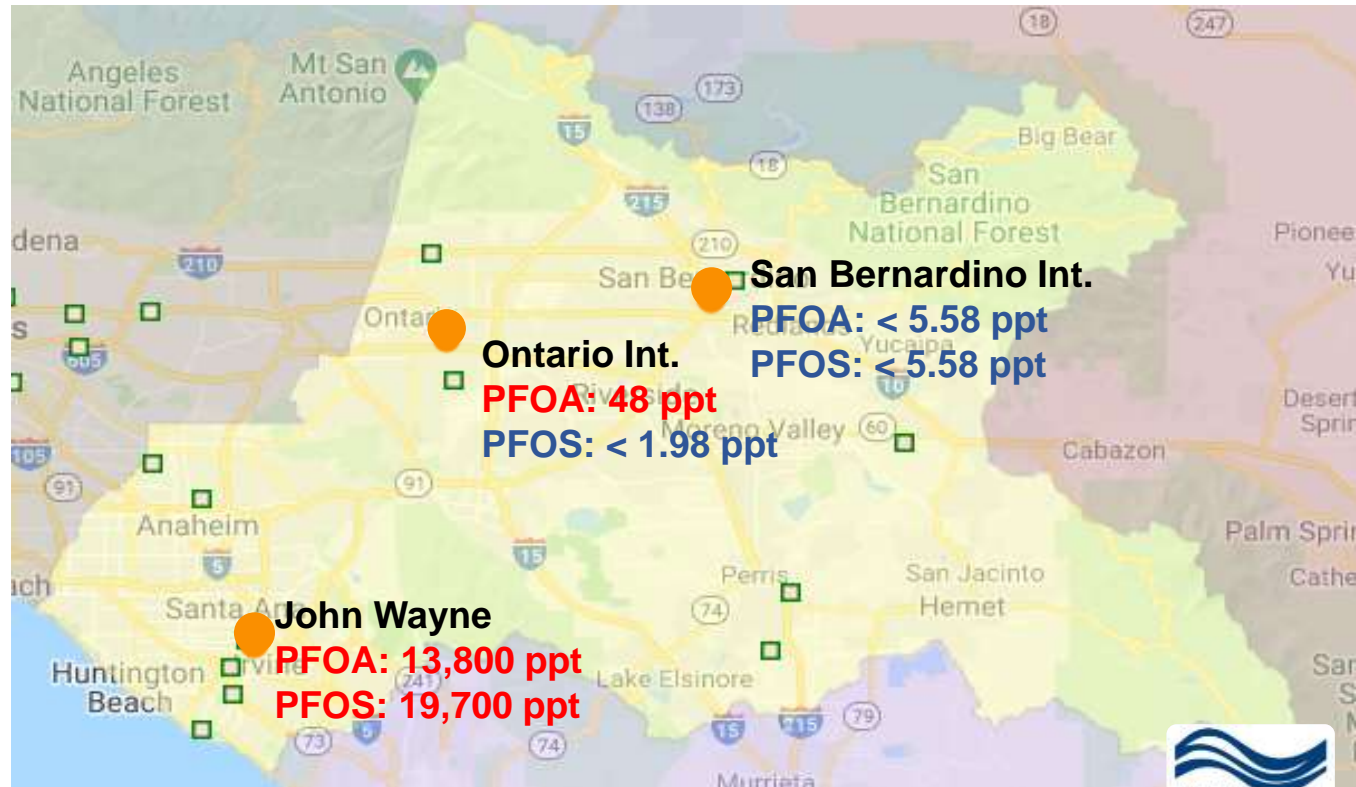


Source: GeoTracker



# Maximum PFOA/PFOS Detections Groundwater - Airports

- Drinking water NLs:
  - PFOA: 5.1 ppt
  - PFOS: 6.5 ppt
- Drinking water RLs:
  - PFOA: 10 ppt
  - PFOS: 40 ppt



Source: GeoTracker



## Maximum PFOA/PFOS Detections Groundwater - Bulk Fuel Terminals

➤ Maximum detections statewide:

PFOA: 28,000 ppt

PFOS: 990,000 ppt



<https://www.waterboards.ca.gov/pfas/>



# Maximum PFOA/PFOS Detections Groundwater - Chromium Plating Facilities

- Maximum detections statewide:

PFOA: 3,600 ppt

PFOS: 68,000 ppt



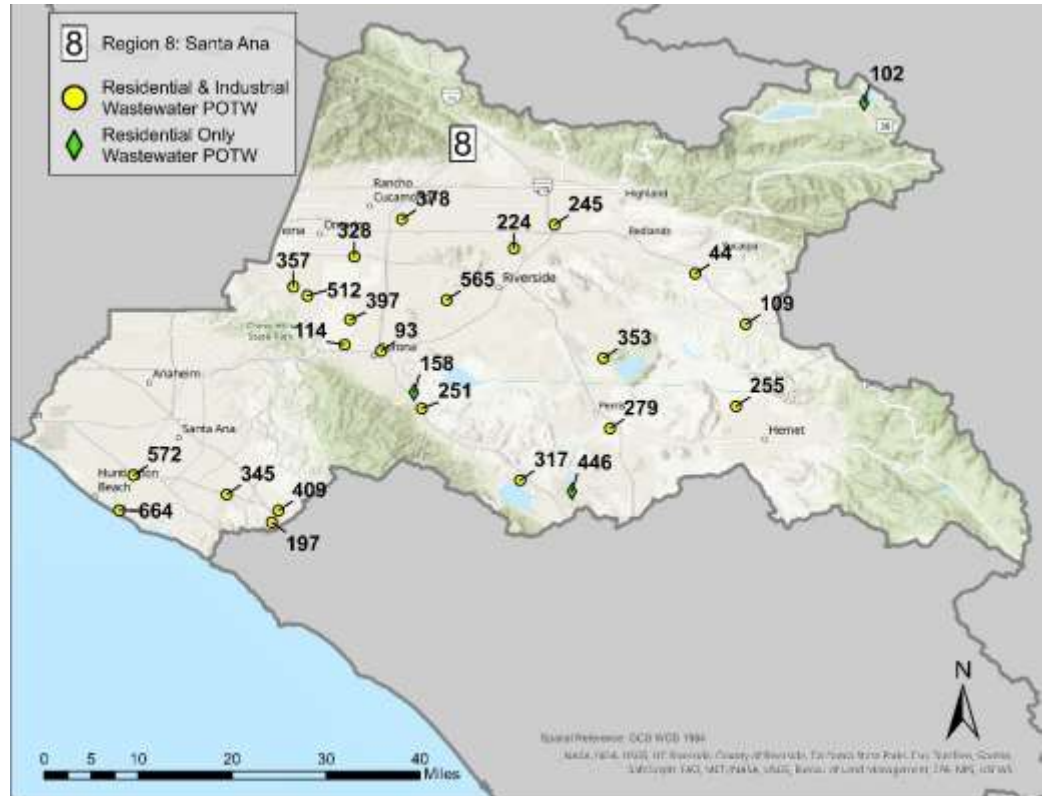
<https://www.waterboards.ca.gov/pfas/>





# Average of Total PFAS in Effluent of WWTPs

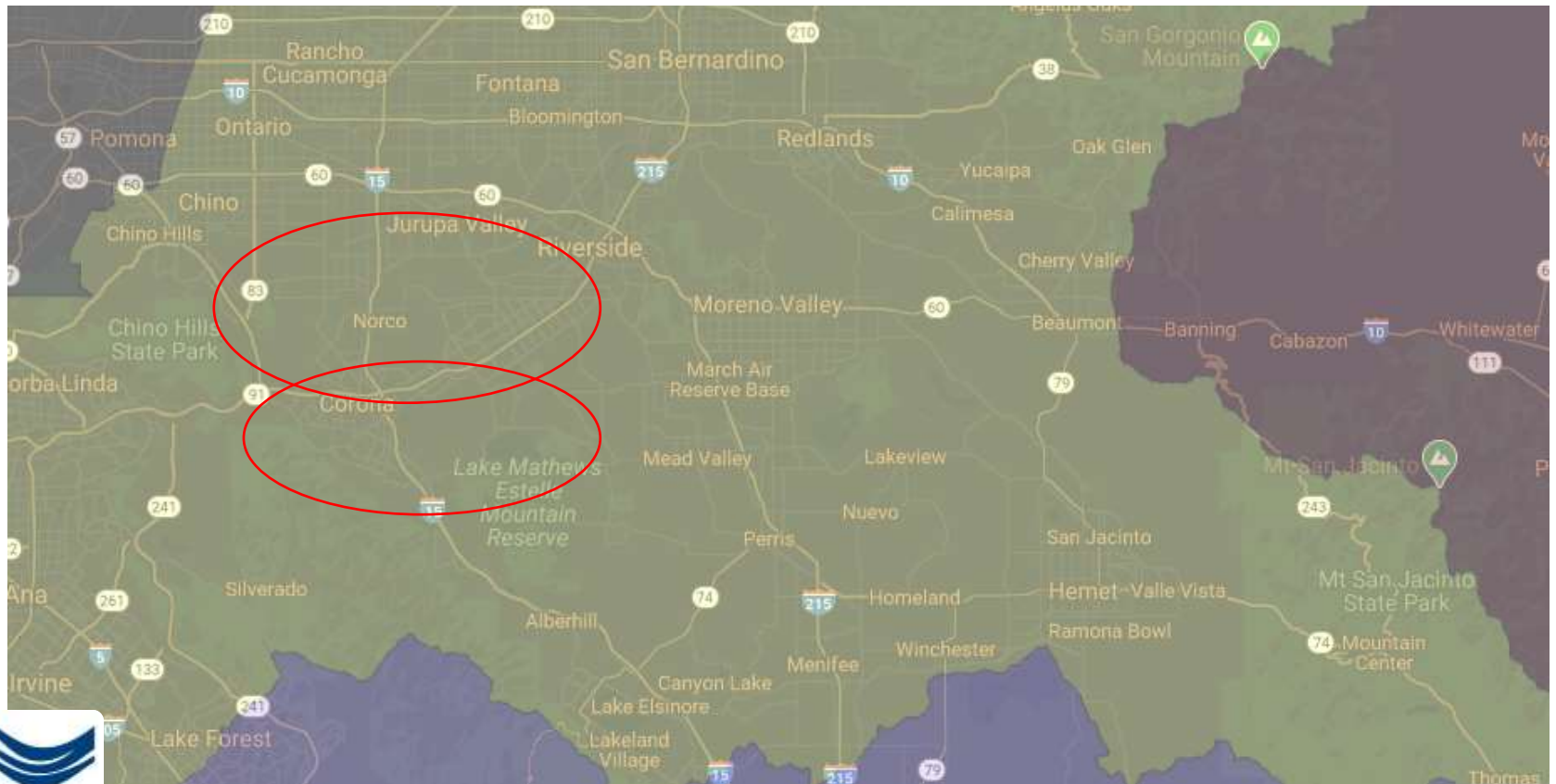
- Average Detections in R8:  
**PFOA: 13.2 ppt**  
**PFOS: 8.6 ppt**
- Maximum Detections in R8:  
**PFOA: 30.7 ppt**  
**PFOS: 231 ppt**
- Statewide Max PFOA: 152 ppt  
 Statewide Max PFOS : 2,420 ppt



Samples were analyzed using method compliant with the DoD QSM with 25 to 38 analytes.

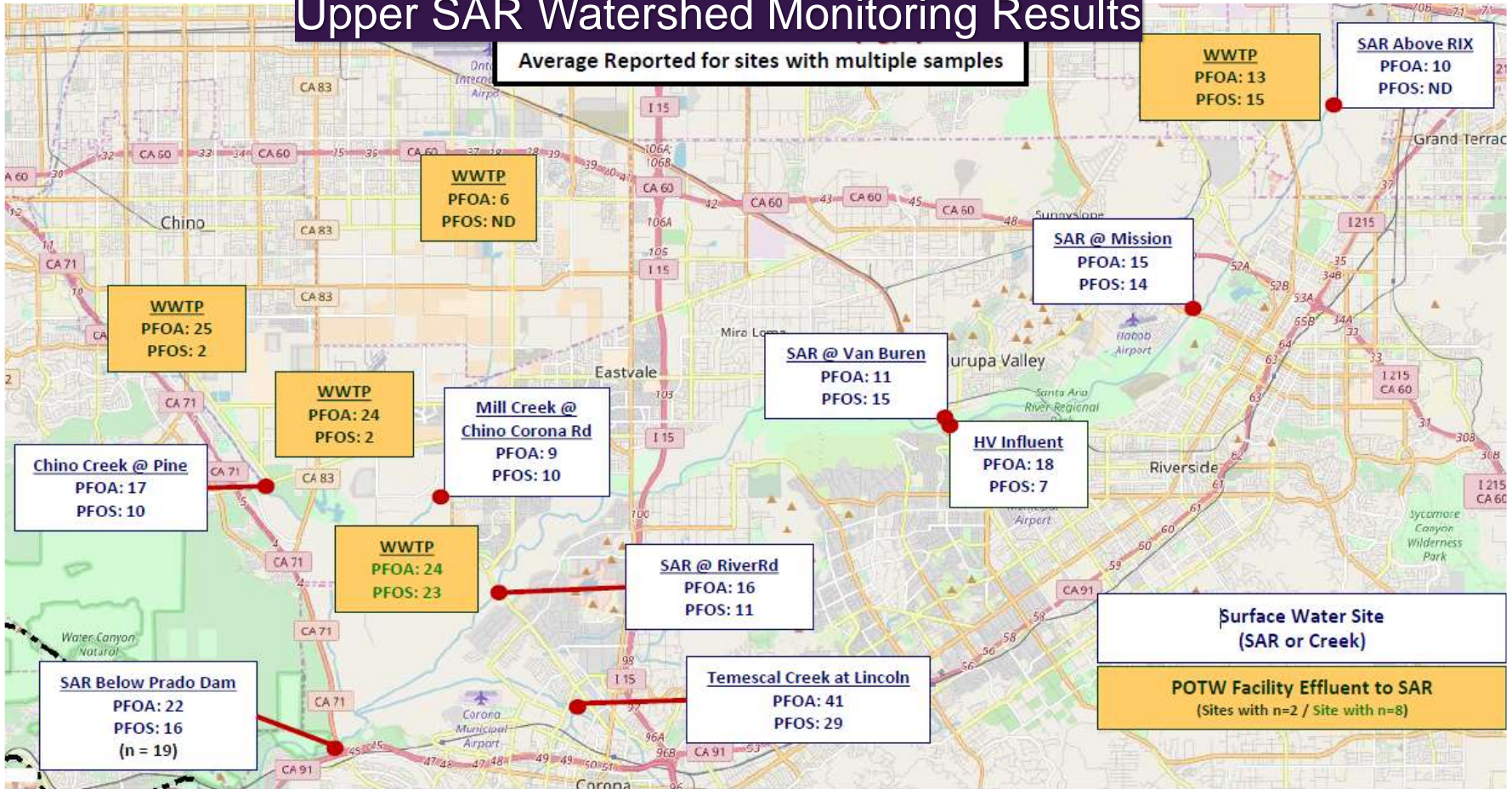


# OCWD PFAS Investigations



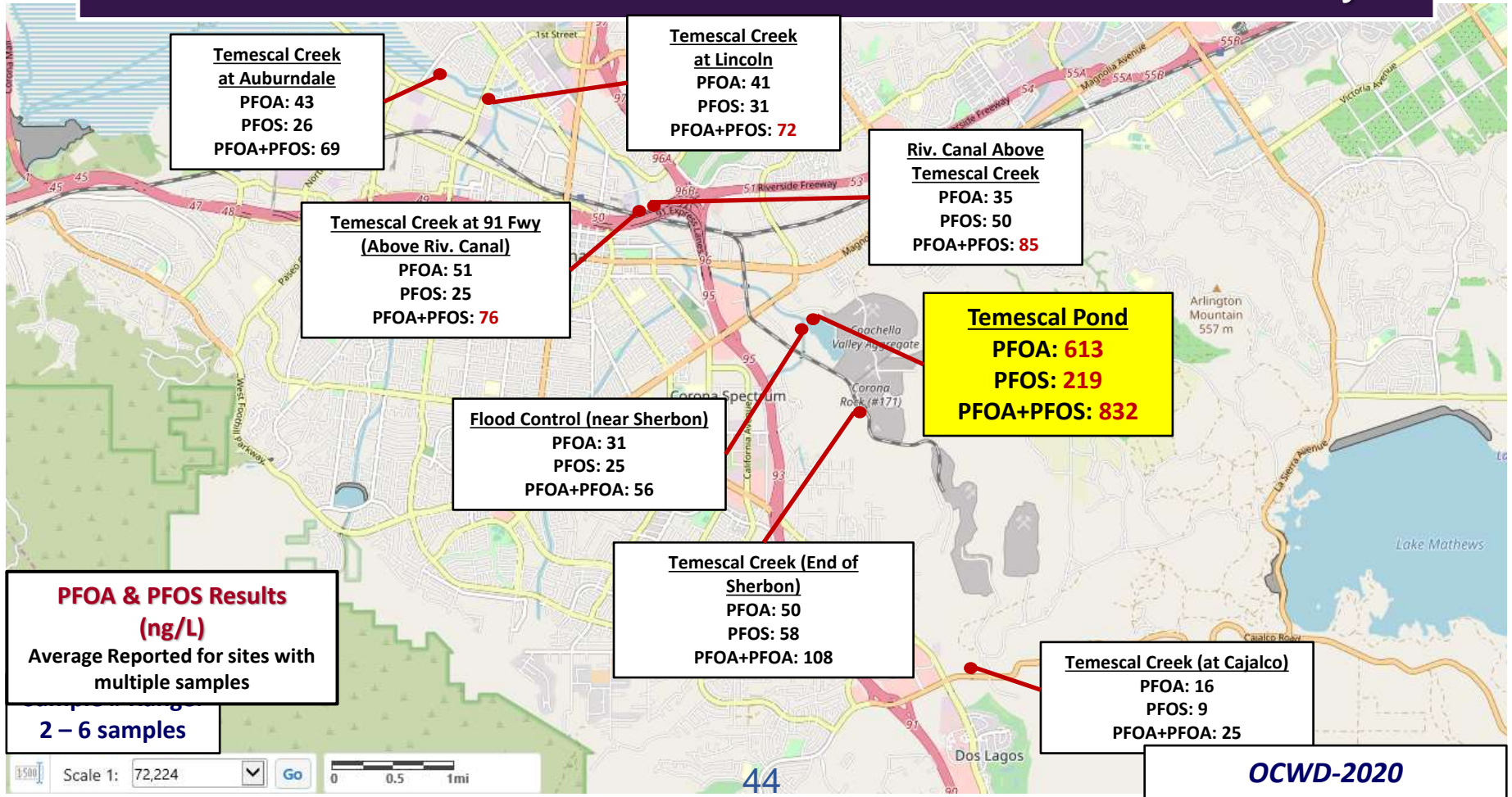
# Upper SAR Watershed Monitoring Results

Average Reported for sites with multiple samples



(OCWD-2019)

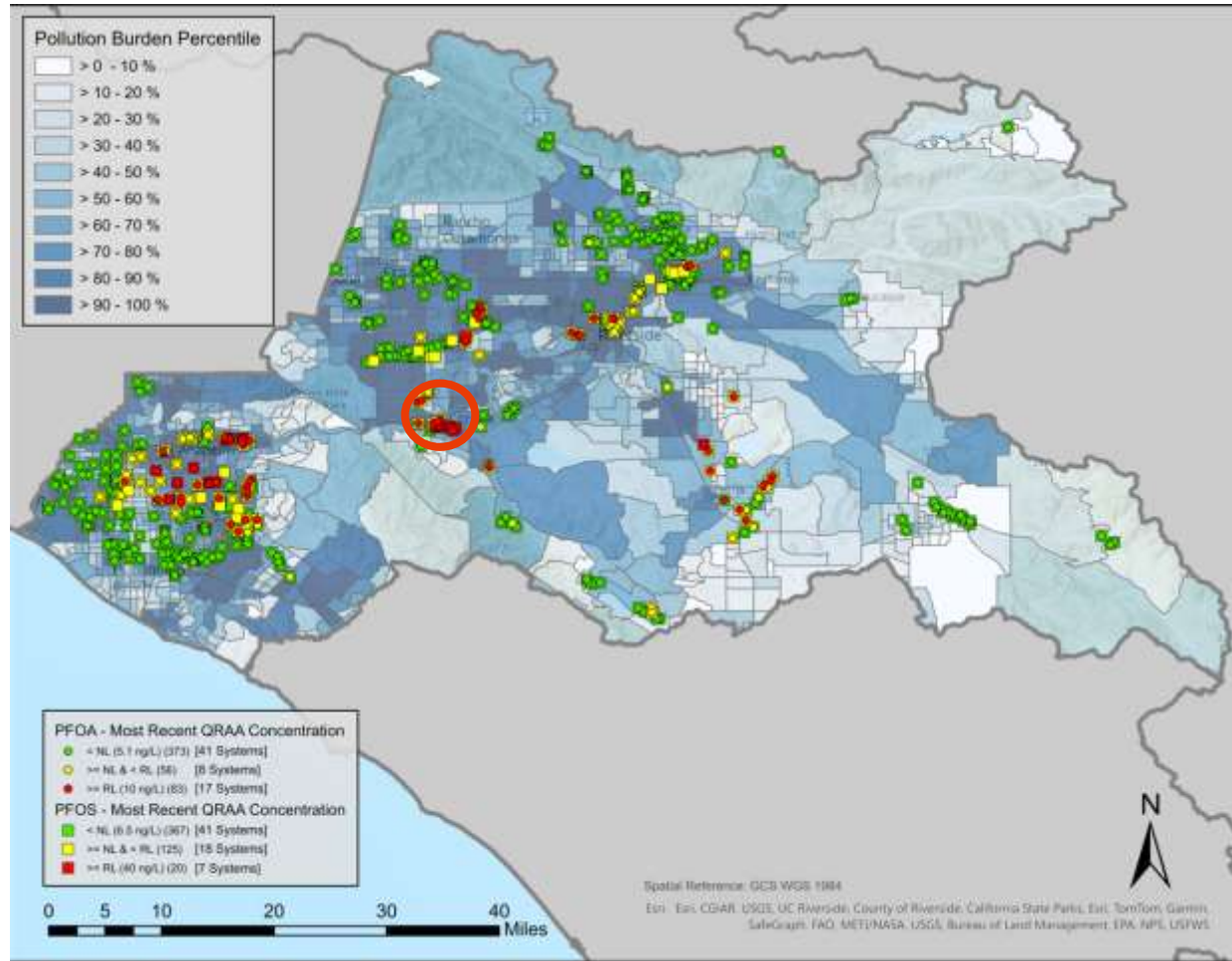
# Temescal Creek Watershed PFAS Results Summary



# Drinking Water Supply Wells PFOA/PFOS > NLs/RLs

Data downloaded in February 2024:

- Raw water results
- QRAA = Quarterly Running Annual Average
- PFOA and PFOS analyzed using EPA Method 537.1
- PFOA: NL = 5.1 ng/L, RL = 10 ng/L  
PFOS: NL = 6.5 ng/L, RL = 40 ng/L



# Drinking Water Supply Wells PFOA/PFOS > NLs

## ➤ Statewide Detections:

Total No. of Supply Wells Tested: **2,958**  
PFOA impacted above NL: **382 wells**  
Max PFOA detected : **350 ppt**

PFOS Impacted above NL: **459 wells**  
Max PFOS detected: **260 ppt**

## ➤ R8 Detections:

Total No. of Supply Wells Tested: **512**  
PFOA impacted above NL: **142 wells**  
Max QRAA PFOA detected : **240 ppt**

PFOS Impacted above NL: **145 wells**  
Max QRAA PFOS detected: **240 ppt**



# What Do We Know

- Many military and industrial facilities are sources of PFAS which have impacted water quality in the Santa Ana Region
- Detections in groundwater mostly above drinking water NLs and often above RLs
- Detections in Santa Ana River greater than drinking water NLs



# What Is In The Horizon

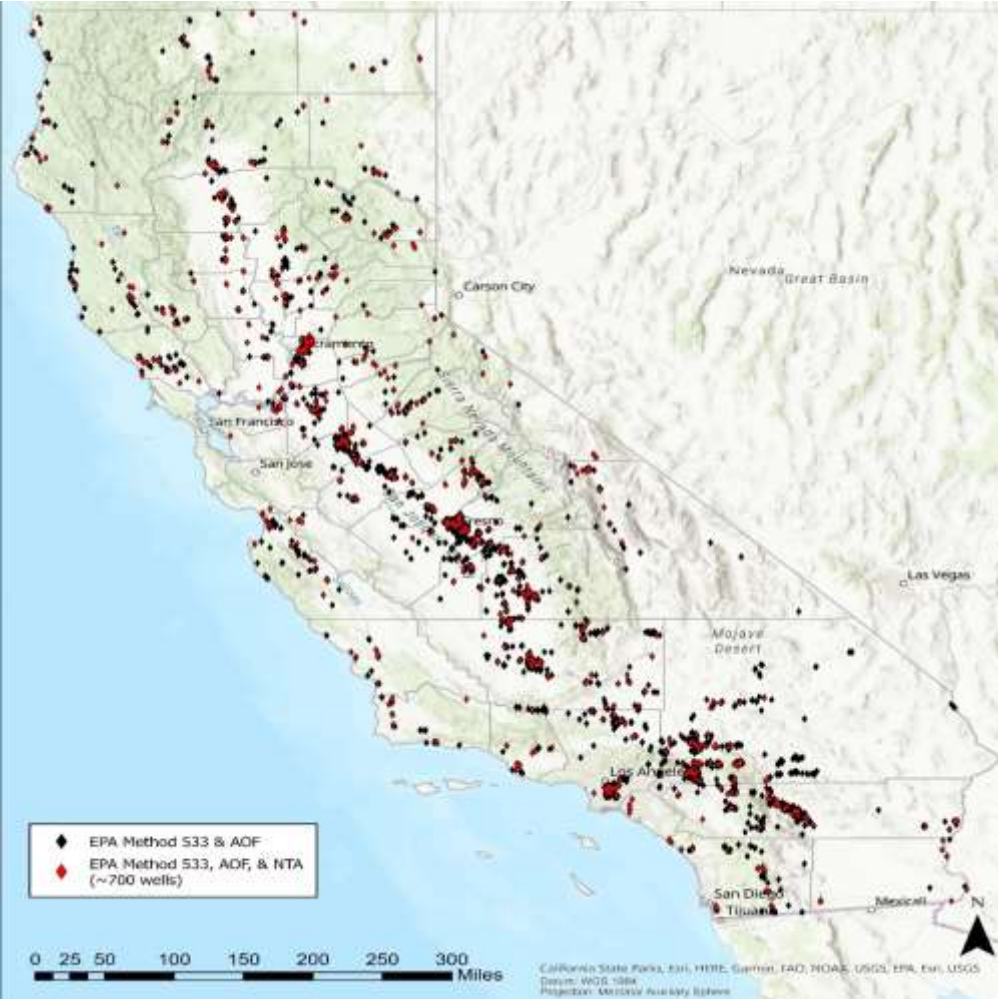
- Santa Ana Water Board continues working with local agencies and other stakeholders to identify additional major sources of PFAS in groundwater and surface water
- Addressing these challenges requires a multi-layered approach that should include scientific research, stakeholders' engagement, and investment in resources, infrastructure, and new technologies





## AB-178 (Budget Act of 2022)

- Develop and validate a **broad-spectrum test method** for the class of PFAS
- Sample nearly 4,000 public water wells serving disadvantaged and severely disadvantaged communities
- Develop a **treatment-based regulation** for the entire class of PFAS



# Questions/Comments

The State Board staff, Wendy Linck and Richard Nelson.

Mehrnoosh.Behrooz@waterboards.ca.gov

## Information:

<https://www.waterboards.ca.gov/pfas/>



# Progress on Regulating PFAS Usage in California

**SB-1044 (Allen)** – Prohibits fluorinated AFFF use.  
**AB 756 (Garcia)** – Requires municipalities to notify consumers for PFAS detected above NLs and provides broader investigation authorities to State Water Board.

**SB 1335 (Allen)** - Food services in state-owned facilities properties, or under state contract, must use food packaging that is reusable, recyclable, compostable, and PFAS free.  
**AB 1200 (Ting)** - Bans plant fiber-based food packaging containing PFAS that are either intentionally added or present at levels exceeding 100 ppm total fluorine. Chemical disclosures on cookware.

**SB 2771 (Friedman)** – Proposes to prohibit the use of PFAS as intentionally added to cosmetics.  
**AB 1817 (Ting)** - Proposes to prohibit the sale of textile articles that contain regulated PFAS.  
**AB 2247 (Bloom)** – Proposes to prohibit the use of PFAS (and other ingredients) intentionally added to cosmetics and provides a reporting platform for product registration and information about PFAS used in the product.

2020

✓ PFOA RL = 10 ppt,  
PFOS RL = 40 ppt

2021

- ✓ Carpets and Rugs containing PFAS as a class are designated as a Priority Product.
- ✓ PFOS is listed (Prop 65) as a chemical known to cause cancer.
- ✓ PFBS RL = 5 ppb.
- ✓ Draft PHG issued for PFOA and PFOS.

2022

- ✓ PFOA is listed (Prop 65) as a chemical known to cause cancer.
- ✓ Treatments containing PFAS (as a class) for use on converted textiles and leathers that are manufactured in or imported to California as a Priority Product.
- ☐ PFHxS RL

California Legislature

CalEPA Agencies

# Major Lawsuits

- The Orange County Water District (OCWD), along with several water retailers in Southern California, filed a lawsuit against PFAS manufacturers (December 2020):
  - Contamination of Water Supplies
  - Failure to Warn
  - Seeking Damages
  - Accountability and Remediation
- California has filed lawsuits against PFAS manufacturers (Nov. 2022). Allegations: the contamination of drinking water supplies, soil, and other environmental resources. The lawsuits seek damages for the costs associated with investigating, monitoring, and treating PFAS contamination, as well as for endangering public health.



## Roy L. Herndon

Orange County Water District  
18700 Ward Street  
Fountain Valley, CA 92708  
Phone: (714) 378-3260  
Email: rherndon@ocwd.com

- Chief Hydrogeologist at the Orange County Water District, which manages the 350-square mile Orange County Groundwater Basin.
- Directs the activities of OCWD's Hydrogeology Department, including numerical groundwater modeling, seawater intrusion barrier performance and improvements, and basin-wide and local-scale groundwater programs and investigations.
- Practicing hydrogeologist for more than 35 years and has served on technical advisory panels for entities including the California Department of Water Resources and the Republic of Singapore.
- B.A. in Geology from Colorado College, a M.S. degree in Hydrology and Water Resources from the University of Arizona,
- California licensed geologist and certified hydrogeologist.





# Addressing PFAS Impacts at a Groundwater Basin Scale



SINCE 1933

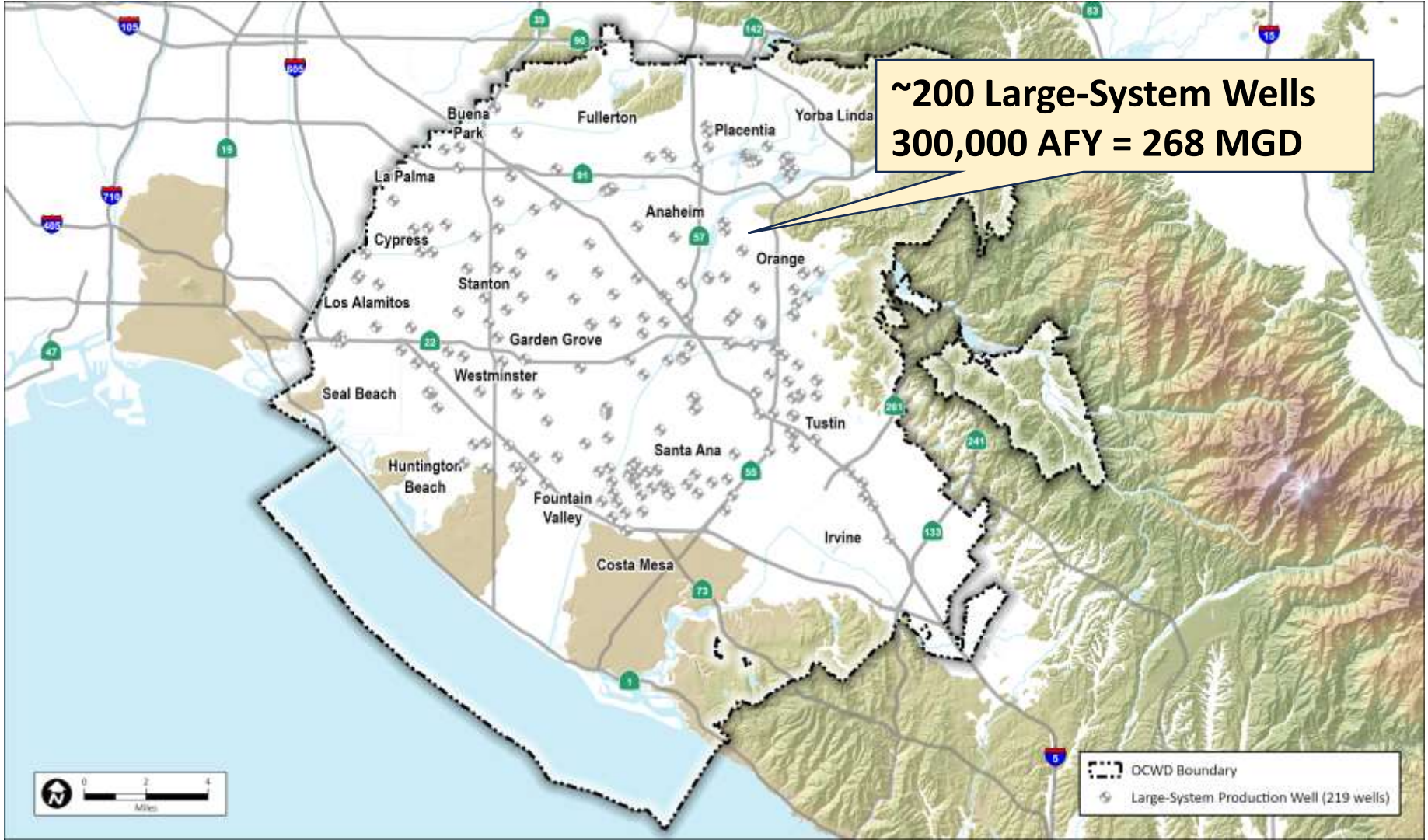
Roy Herndon  
Chief Hydrogeologist, Orange County Water District

Society of American Military Engineers and Professional Environmental Management Association Speakers Panel  
March 7, 2024, Cypress, CA

# Orange County Water District

- Formed in 1933
- Sustainably manage GW basin
- Groundwater = **85%** of local supply
- 19 cities & special water districts
- 2.5 million residents







# PFAS Impacts at OCWD To Date



**\$1B+ COST**

for treatment system capital, O&M, interim replacement water  
*(over 30 years, and all costs likely to increase)*



**62 WELLS**

have or need treatment  
*(likely 40+ more in future)*



**11 RETAILERS**

currently impacted  
*(more likely in future)*



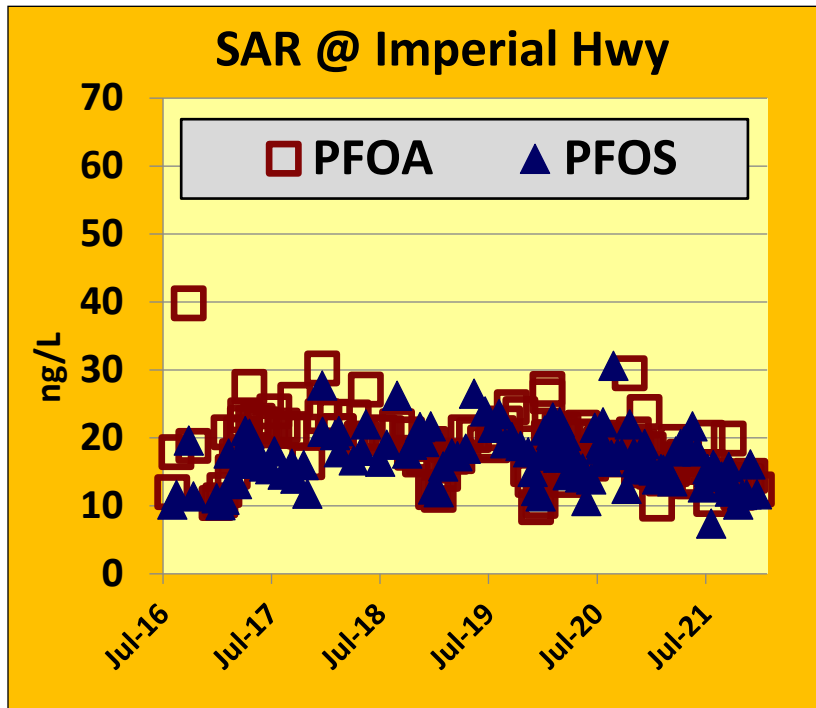
**39 SYSTEMS**

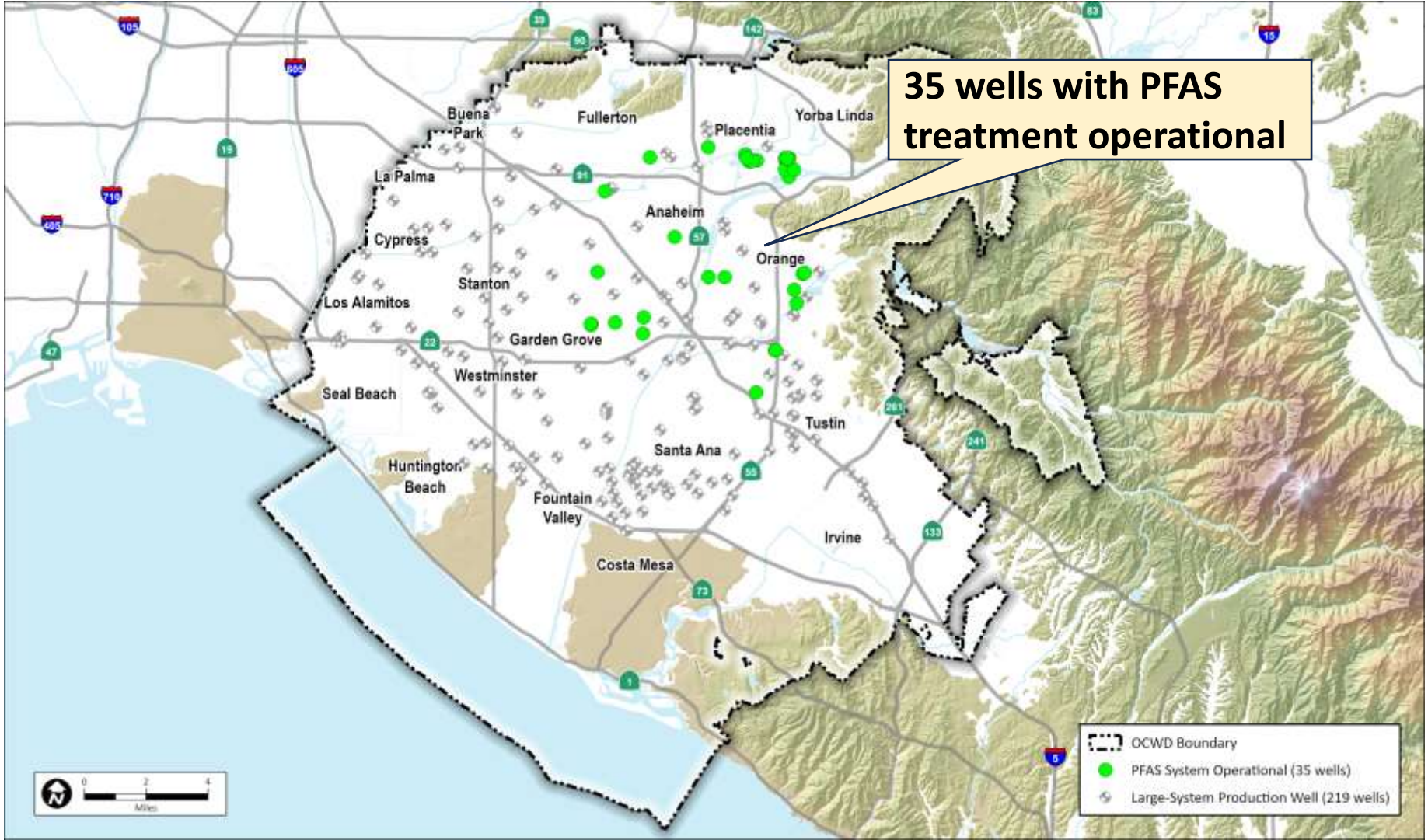
being built or in operation to remove PFAS from local well water  
*(more in future)*

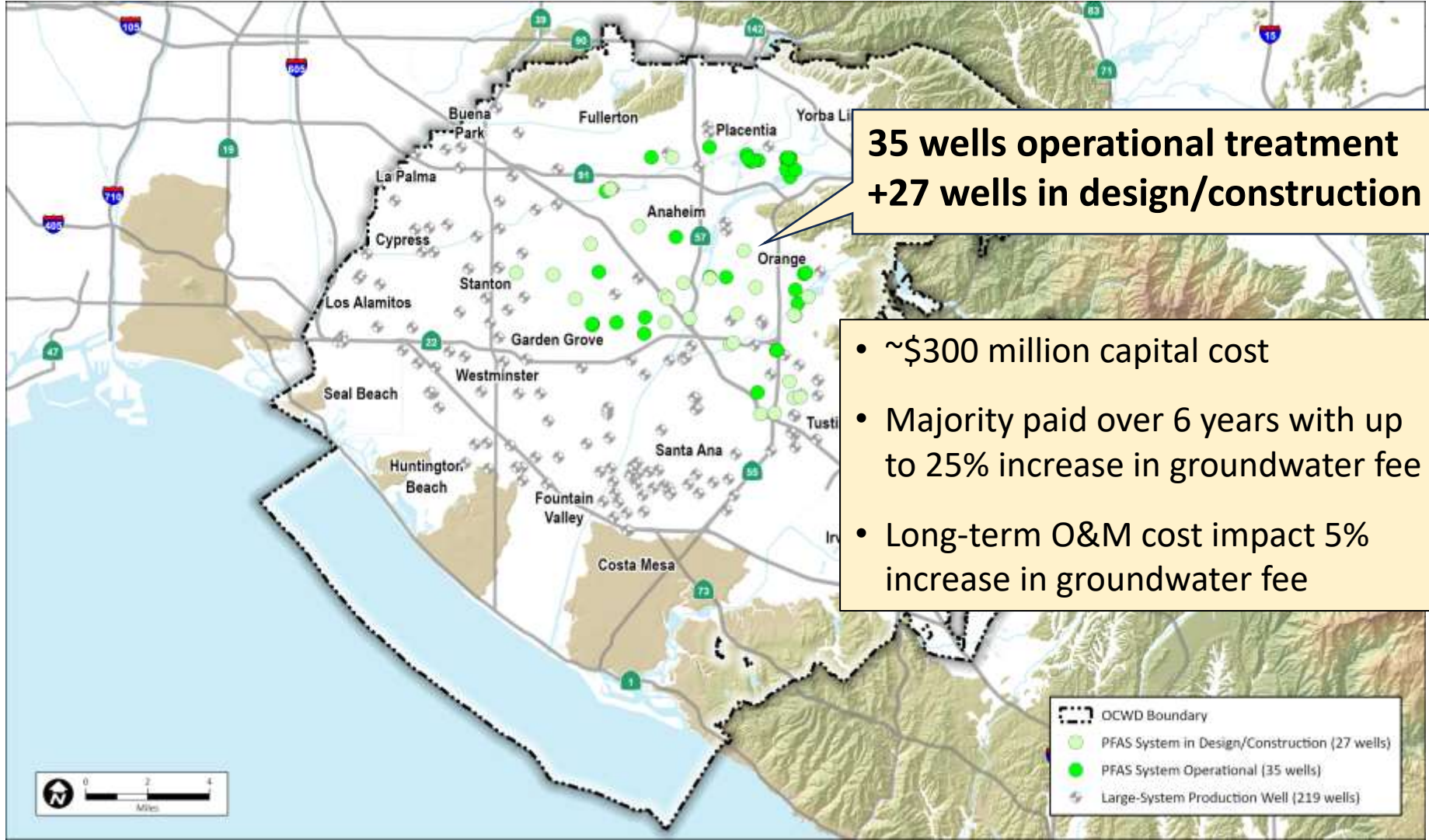
# PFAS Occurrence

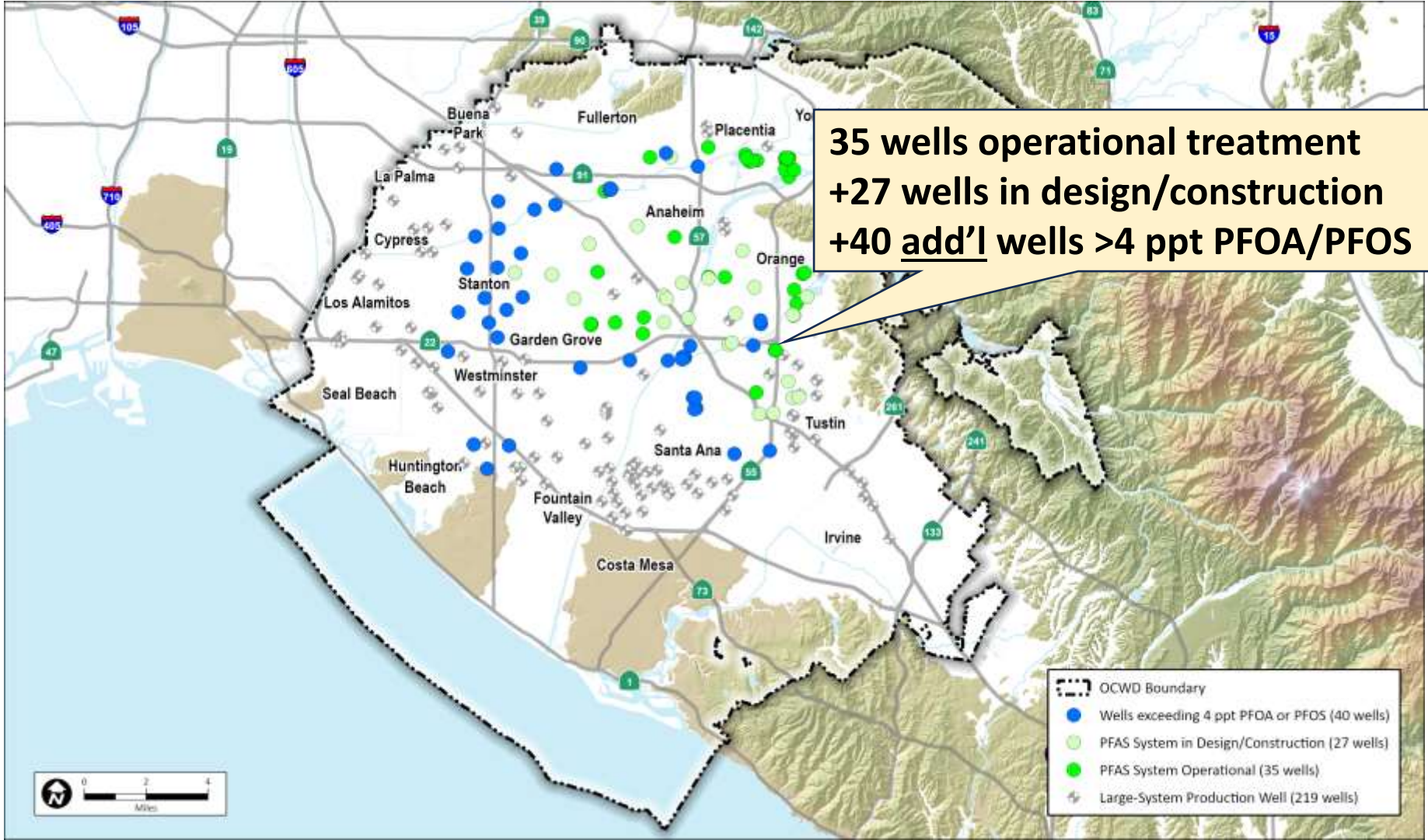
- In Santa Ana River water recharged for decades
- Millions of acre-feet impacted
- Not detected in imported water or OCWD's GWRS recycled water

GW PFOA detections generally 10-50 ng/L









# Most of the treatment facilities use ion exchange (IX).

- Shorter contact time → Smaller footprint vs. GAC
- No backwash infrastructure required
- Lower cap. cost
- Successful pilot testing



# IX PFAS treatment systems range in capacity.

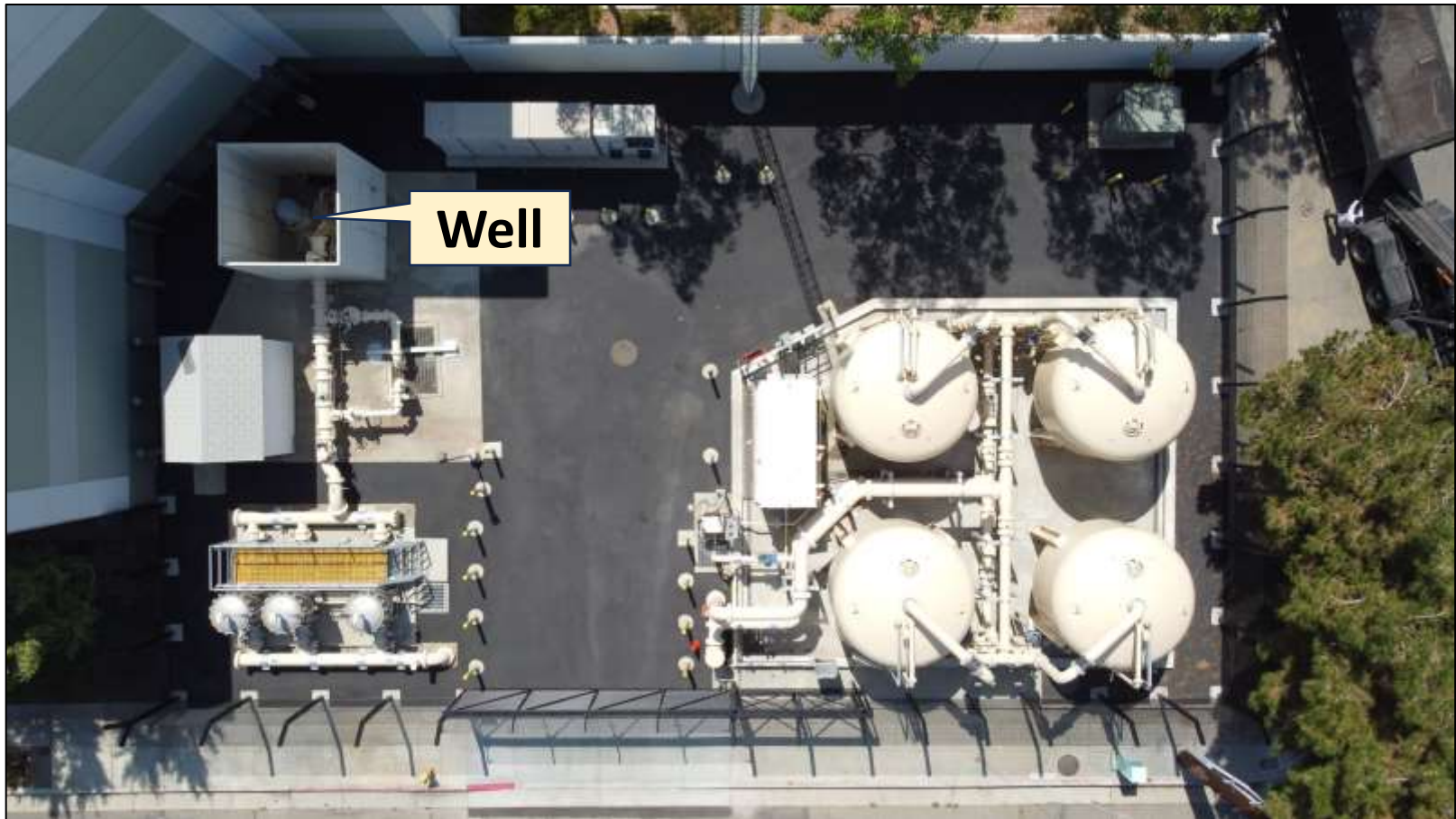
**2 mgd (Orange Well 9)**



**Nation's Largest – Yorba Linda WD  
19 mgd (10 wells)**



**Fortunately, most well sites could accommodate the treatment systems – barely in this case.**





# Fullerton's Main Plant treatment system uses 10 GAC vessels for PFAS and VOCs.



26 ft



# OCWD Policy Response to PFAS

- OCWD Board Policy established in Jan. 2020
  - OCWD funds 100% of PFAS treatment system capital cost
  - Retail agency to own & operate treatment system
  - O&M costs split 50/50 between OCWD and Retailer
- Supported by non-affected retail agencies



## Litigation filed in December 2020

- OCWD and 10 impacted retail water systems filed suit against 3M, Dupont, Chemours, and others
- Any settlements likely to be a fraction of our actual costs





# Thank you!

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(714) 378-3260

<https://www.ocwd.com/what-we-do/water-quality/pfas/>

# Riz Sarmiento, Ph.D.

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Staff Toxicologist  
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Department of Toxic Substances Control  
California Environmental Protection Agency

- Staff Toxicologist, Human and Ecological Risk Office at DTSC
- Part of DTSC's PFAS work group, aimed to disseminate information internally, particularly to project managers, about recent developments in addressing PFAS
- Provides regulatory oversight on DOD sites and commercial/industrial sites.
- Over 20 years of experience as a Principal Scientist in different environmental consulting/engineering firms before joining DTSC.
- Managed and conducted multi-media risk assessments in EPA Regions 2, 6, 7, 8, 9, and 10.
- Ph.D. in Molecular Biology from Caltech and conducted two years of post-doctoral research
- Former adjunct professor at Columbia University



# **Impacts of PFAS on Federal Entities, Local Municipalities, and Regulatory Agencies**

**Society of American Military Engineers  
(SAME)/Professional Environmental Management (PEMA)  
Panel Discussion – March 7, 2023**

Riz A. Sarmiento, Ph.D., Department of Toxic Substances Control



## Topics

- Overview of DTSC programs addressing PFAS
- DTSC Safer Consumer Products Program
- Work in progress.

## Programs within DTSC Addressing PFAS

- Safer Consumer Products (SCP)
- Environmental Chemistry Laboratory (ECL)
- Site Mitigation and Restoration Program (SMRP)



## DTSC – Safer Consumer Products (SCP) Program

- **2008** – CA legislature passed AB 1879. Required adoption of regulations to establish a process for identifying and prioritizing chemicals in consumer products that have the potential to have adverse impacts to public health and environment, and to establish a process for evaluating potential safer alternatives.
- California's Green Chemistry law - aims to reduce toxic chemicals in consumer products.
- Approved by the Office of Administrative Law on August 28, 2013
- Regulations effective as of October 1, 2013

## Environmental Chemistry Laboratory (ECL)

- Supports DTSC's SCP and looking into product testing for PFAS (e.g., compliance testing in carpets and rugs, spray on upholstery, artificial turf).
- Helped develop USEPA Method SW-846 Test Method 8327.
- Analyzed PFAS in wastewater in Bay area

## Site Mitigation and Restoration Program (SMRP)

- Regulatory oversight of Department of Defense ( DOD) and non-DOD site investigations and remediation of PFAS.
- Coordinates with Water Board on PFAS investigations
- Manage PFAS at orphan sites.
- PFAS Work Group to share information, track PFAS status and coordinate work at cleanup sites



## DTSC – Hazardous Waste Management Program

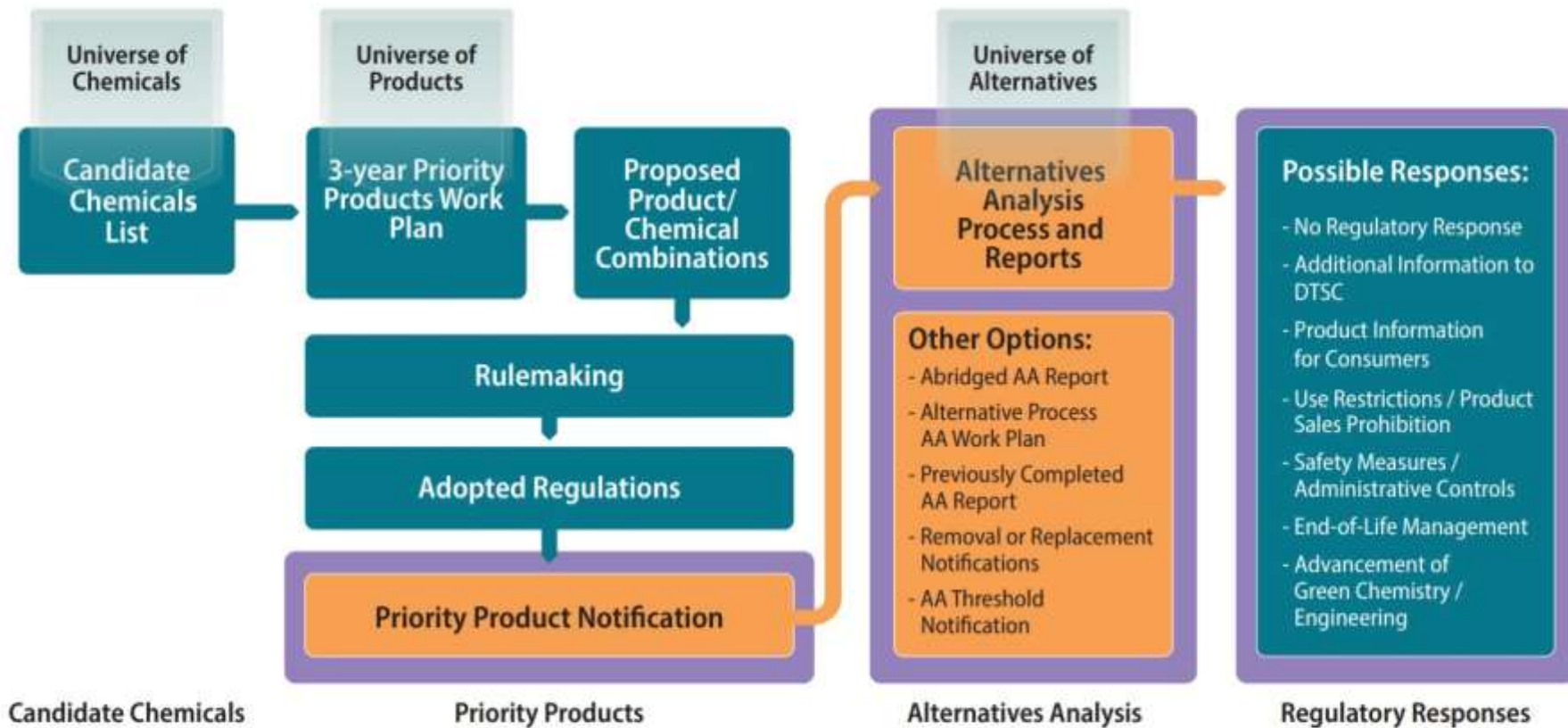
- The USEPA has not yet listed PFAS as hazardous wastes or substances under Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Emergency Planning and Community Right to Know Act or the Clean Air Act.
- Therefore, DTSC permit is currently not needed for treatment or disposal at this time.

## Goals of the SCP Program

- Reduce hazardous chemicals in consumer products.
- Increase the adoption of green chemistry principles and safer alternatives to chemicals of concern in consumer products.

# Main Elements In Implementation of SCP Regulations

- Identify Candidate Chemicals
- Identify Priority Products
- Alternatives Analysis
- Regulatory Responses



DTSC

Responsible Entity

The SCP regulatory steps shaded in purple are subject to compliance and enforcement actions.

## Two of the Priority Product Categories

1. Treatments Containing PFAS for Use on Converted Textiles or Leathers (Effective 4/1/22)
2. Carpets and Rugs with PFAS (Effective 7/1/21).

### What does this mean?

- Domestic and foreign manufacturers of PFAS-containing products that are being sold in California are required to submit a Priority Product Notification through DTSC's CalSAFER portal, within 60 days of listing.
- Additional documentation, such as intent to remove or replace the product or chemical, or a Preliminary Alternatives Analyses, must be submitted within 180 days.



## **AB 1200 Approved by the Governor – Oct 5, 2021**

Prohibits, beginning January 1, 2023, any person from distributing, selling, or offering for sale in the state any food packaging that contains regulated perfluoroalkyl and polyfluoroalkyl substances or PFAS at or above 100 parts per million in total organic fluorine.

Requires a manufacturer to use the least toxic alternative when replacing regulated PFAS in food packaging.

## **AB 1200 Approved by the Governor – Oct 5, 2021 (cont'd)**

Beginning January 1, 2024, requires a manufacturer of cookware sold in the state to list the presence of PFAS in the product label when present in the handle of the product or in any product surface that comes into contact with food, foodstuffs, or beverages.

## **AB 652 Approved by the Governor – Oct 5, 2021**

Prohibits, beginning July 1, 2023, any person, including a manufacturer, from selling or distributing in commerce in this state any new juvenile product that contains regulated perfluoroalkyl and polyfluoroalkyl substances (PFAS).

The bill requires a manufacturer to use the least toxic alternative when replacing PFAS chemicals in a juvenile product.

## Comparison of Regulatory / Potential Screening Levels for PFAS in Water (ng/L or ppt)

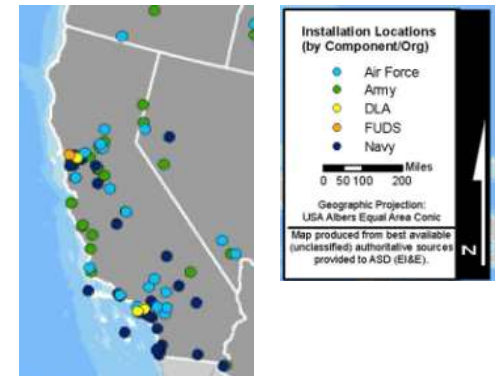
	USEPA Health Advisory	USEPA MCL (Proposed)	USEPA Regional Screening Level for Tap Water (11/2023) (THQ=0.1)	California Public Health Goal (Proposed)	California Notification Level	California Response Level
PFOA	0.004	4	6	0.007	5.1	10
PFOS	0.02	4	4	1	6.5	40
PFNA		HI = 1.0	5.9			
PFHxS			39		3	20
PFBS	2,000		600		500	5,000
HFPO-DA/GenX	10		1.5			
PFBA			1,800			
PFHxA			990			

## DOD Sites: PFAS Screening Levels

- Screening levels for 8 PFAS compounds based on USEPA RSLs (May 2023)/DOD guidance (Aug 2023).
- New/updated RSLs (e.g., Nov 2023 RSLs) expected to be adopted in the future
- Currently the DOD does not accept California SWRCB's NLs/RLs or SFBRWQCB's ESLs as screening levels.
- Promulgated state standards may be considered as ARARs in the FS.

# Overseeing DOD's PFAS Investigation and Remediation in California

- DOD's Response to PFAS Contamination
  - Quickly address PFOS/PFOA in drinking water & cut off exposure when necessary.
  - Follow CERCLA process to fully investigate releases, prioritize responses, and determine appropriate cleanup actions based on risk
    - 23 RIs being planned, 31 RIs underway  
(as of March 31, 2023)



Source: DOD Briefing for the Committees on Armed Services of the Senate and the House of Representatives, Sept 2023

# 62 Military Facilities in California with Known or Suspected PFAS Releases

AIRFORCE			NAVY / MARINE CORPS		
<ul style="list-style-type: none"> <li>Air Force Plant 42</li> <li>Beale Air Force Base</li> <li>Castle Air Force Base</li> <li>Channel Islands ANG</li> <li>Edwards Air Force Base</li> <li>Fresno ANG Base</li> </ul>	<ul style="list-style-type: none"> <li>George Air Force Base</li> <li>Los Angeles Air Force Base</li> <li>March Air Force Base</li> <li>March Air Reserve Base</li> <li>Mather Air Force Base</li> <li>McClellan Air Force Base</li> </ul>	<ul style="list-style-type: none"> <li>Moffett Field ANG Station</li> <li>Norton Air Force Base</li> <li>Onizuka Air Force Station</li> <li>Ontario ANG Station</li> <li>Travis Air Force Base</li> <li>Vandenberg Air Force Base</li> </ul>	<ul style="list-style-type: none"> <li>Alameda Naval Complex</li> <li>Azusa NCCOSC Morris Dam</li> <li>Concord NWS</li> <li>Coronado Naval Amphibious Base</li> <li>Crows Landing NALF</li> <li>Hunter Point NSY</li> <li>Long Beach NS</li> <li>Long Beach NSY</li> <li>Mare Island Naval Complex</li> <li>Marine Corps Air Station El Toro</li> <li>Marine Corps Air Station Tustin</li> <li>Marine Corps Logistics Base Barstow</li> </ul>	<ul style="list-style-type: none"> <li>MCAGCC Twenty Nine Palms</li> <li>MCAS Miramar</li> <li>MCB Camp Pendleton</li> <li>NAF El Centro</li> <li>Naval Air Station Lemoore</li> <li>Naval Air Weapons Station China Lake</li> <li>Naval Base Ventura County, Point Mugu</li> <li>Naval Base Ventura County, Port Hueneme</li> <li>Naval Base Ventura County, San Nicolas Island</li> <li>NAVBASE Coronado</li> </ul>	<ul style="list-style-type: none"> <li>NAVBASE Point Loma (SUBBASE)/SPAWAR (SSC)</li> <li>NAVBASE San Diego</li> <li>NAVCOMTELSTA Stockton</li> <li>NAVWPNSTA Seal Beach</li> <li>NAVWPNSTA Seal Beach Fallbrook</li> <li>NOLF Imperial Beach</li> <li>San Diego AUXLNDFLD NAVBASE Coronado</li> <li>San Diego FASWTC PAC NAVBASE Point Loma</li> <li>San Diego Nise-West NAVBASE Point Loma</li> <li>Treasure Island Naval Complex</li> </ul>
ARMY					
<ul style="list-style-type: none"> <li>AFRC Los Alamitos</li> <li>Army Aviation Support ARNG Stockton</li> <li>Camp Roberts</li> <li>Camp San Luis Obispo</li> </ul>	<ul style="list-style-type: none"> <li>Fort Hunter Liggett</li> <li>Fort Irwin</li> <li>Fort Ord</li> <li>Fresno ARNG TASMG</li> <li>Military Ocean Terminal Concord</li> </ul>	<ul style="list-style-type: none"> <li>Roseville Armory ARNG</li> <li>Sacramento AASF</li> <li>Sharpe Army Depot</li> <li>Sierra Army Depot</li> </ul>			

Data as of May 2020, according to SWRCB's website <https://www.waterboards.ca.gov/pfas/military.html>

## PFAS Status at DTSC SMRP Sites

		PA	SI	RI	FS	RA	Short-Term Actions to Address PFAS in Drinking Water	Existing P&T with PFAS Treatment
		Various Phases Mostly Transitioning from SI to RI						
DOD Sites	Air Force (18)						4	2
	Army (13)						2	
	Navy/Marine Corps (31)						3	
	Non-DOD Sites	Data Not Available						



# PFAS Investigations at DOD Sites

- Mostly transitioning from PA/SI to RI
- Some sites investigating non-AFFF sources
  - Recent concern on potential PFAS release from open burning/open detonation of munitions/ordnance containing fluoropolymers
- PFAS PA/SI/ESI
  - EPA recent guidance (Feb 2023) clarified that PA/SI/ESI are not adequate for decision-making at facilities already on NPL and all scoping activities should be considered as part of RI for regulatory review.
- Lab method and analyte list
  - Mostly QSM 5.3 Table B-15/Modified Method 537
  - Draft Method 1633 for all new contracts and task orders starting in 2022 (DOD guidance in Dec 2021)

# Common Observations from DOD's PFAS Investigations

- Potential Modification of Conceptual Site Model (CSM)
  - Should look at AFFF and non-AFFF sources.
  - Recent concerns on open burning/open detonation of munitions/ordnance containing fluoropolymers being a potential source of PFAS.
  - New screening levels may require re-evaluation of sites previously screened out during PA/SI and require further evaluation in the RI.
- Lab method and analyte list
  - Mostly QSM 5.3 Table B-15/Modified Method 537.
  - Transitioning to Draft Method 1633 following DOD guidance (Dec 2021).
  - However, most PFAS investigations currently do NOT analyze the full list of 40 PFAS compounds under Draft Method 1633.

# CERCLA Hazardous Substance Designation

- CERCLA PFAS Enforcement Discretion (based on EPA's recent public listening session in March 2023)
  - EPA intends to **focus** on manufacturers, federal facilities and other industrial parties whose actions result in the release of significant amounts of PFAS.
  - EPA **may choose not to take** CERCLA enforcement action against certain entities.
  - EPA may settle and provide CERCLA **contribution protection** to some parties.

## Implications of EPA's Proposed Designation of PFOA & PFOS as CERCLA Hazardous Substances

- The proposed rule would strengthen DTSC's ability to clean up sites contaminated with PFOA & PFOS and to hold responsible parties accountable for PFAS investigation and cleanup.
- New sites may be required to conduct PFAS investigations.
- Closed/NFA sites or sites under long-term O&M may need to be re-opened for PFAS investigation.
- Existing sites/remedies may need to be re-evaluated and modified to address PFAS contamination.

# Acknowledgments

Shukla Roy-Semmen, Ph.D.  
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HUMAN and ECOLOGICAL RISK OFFICE

LI WANG, PH.D.  
SENIOR HAZARDOUS SUBSTANCES ENGINEER  
ENGINEERING AND SPECIAL PROJECTS OFFICE

# QUESTIONS/COMMENTS ?

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