PFAS MANAGEMENT STRATEGIES for the Livermore Valley Groundwater Basin

Alameda Creek Watershed Conference

May 4, 2023

AGENDA

1. What are PFAS and where did they come from
2. How are PFAS being regulated
3. PFAS in the Livermore Valley Groundwater Basin
4. What can we do now

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PFAS the “Forever Chemicals”

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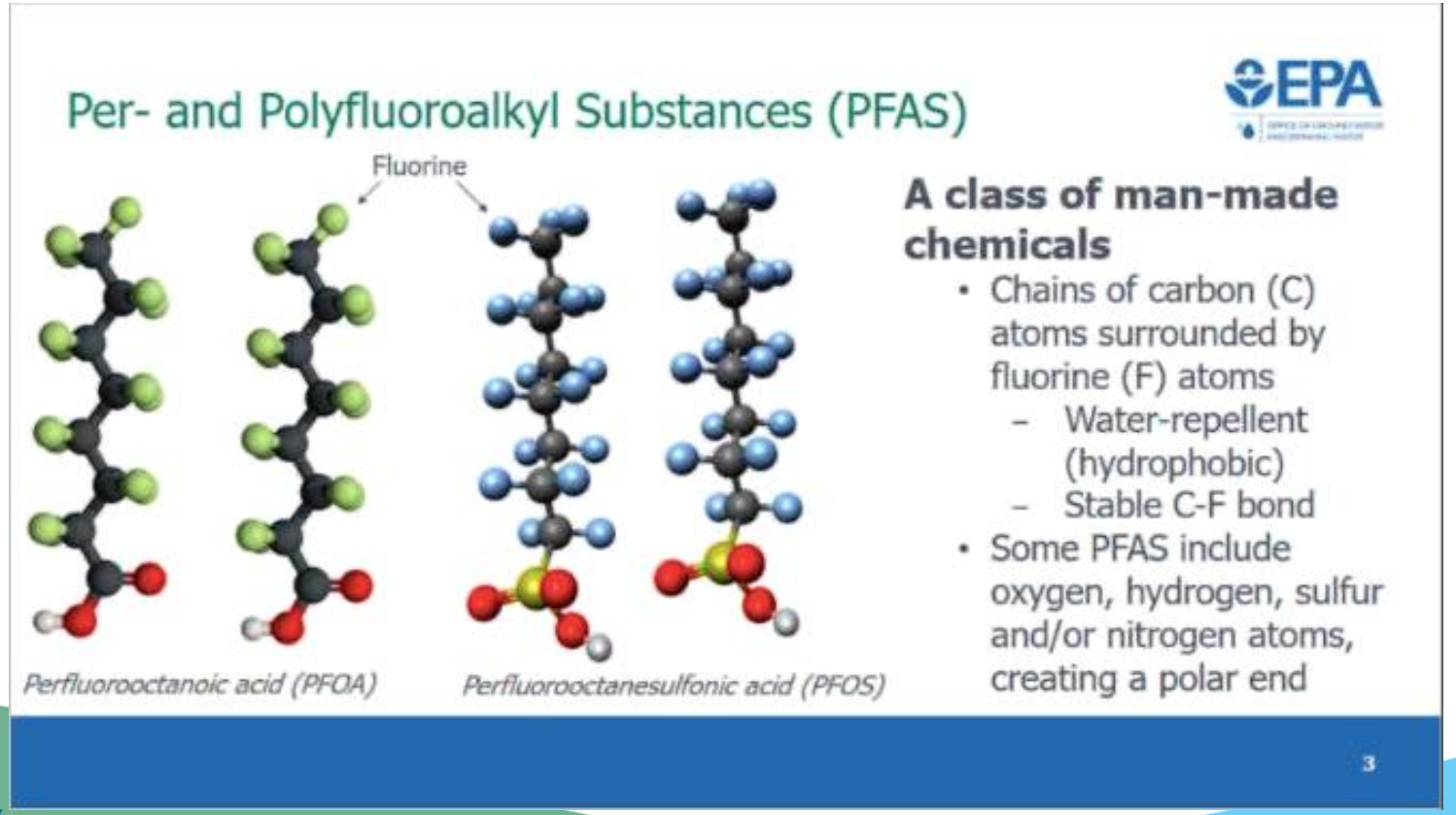
What are PFAS?

Man-made compounds used in a wide-range of products designed to be waterproof, stain-resistant, non-stick, or fire retardant since 1940s



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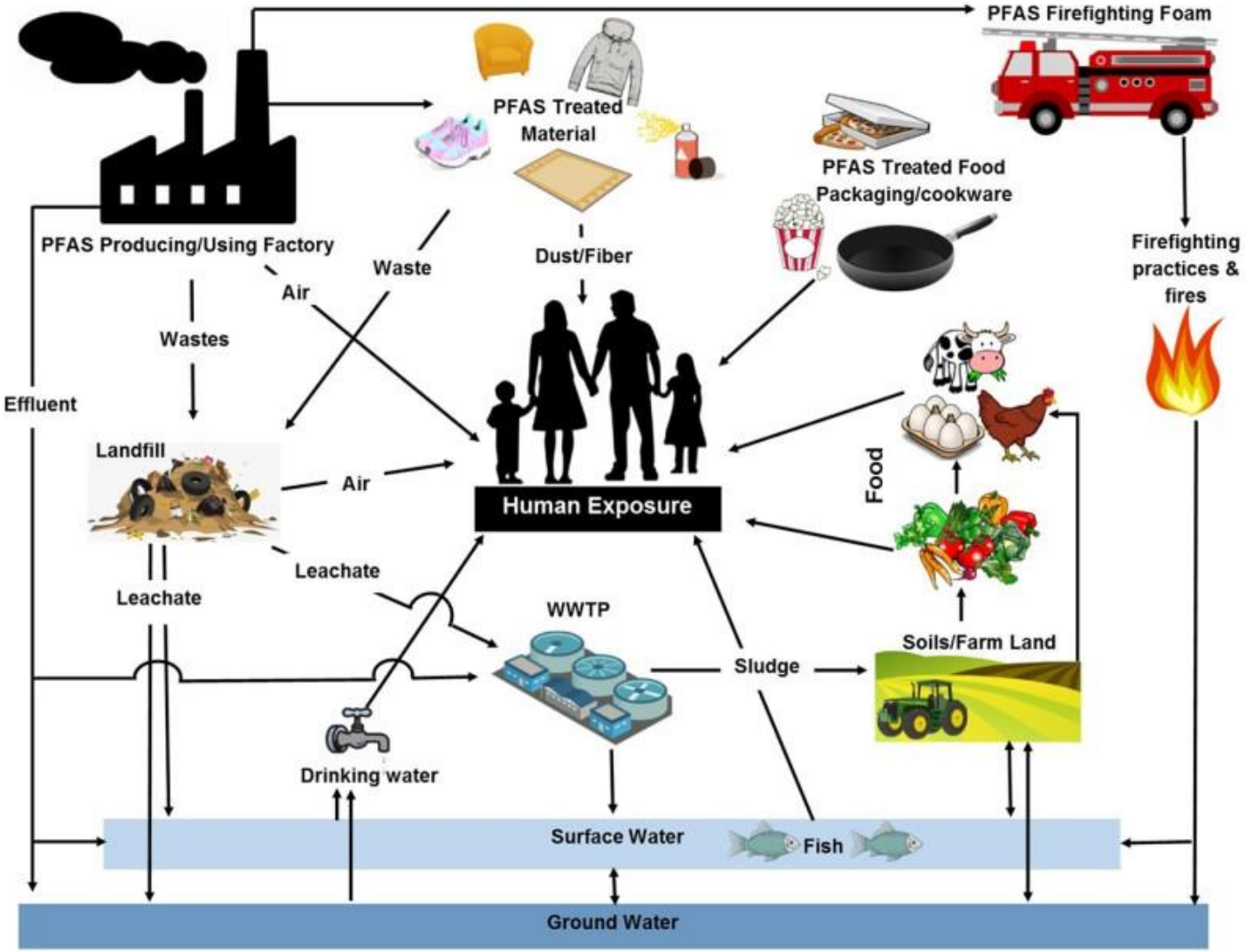
Web of PFAS Exposure in Humans



Human Exposure and sources of PFAS
Image: DWP, adapted from Oliaei et al. 2013.

PFAS – How much is too much?

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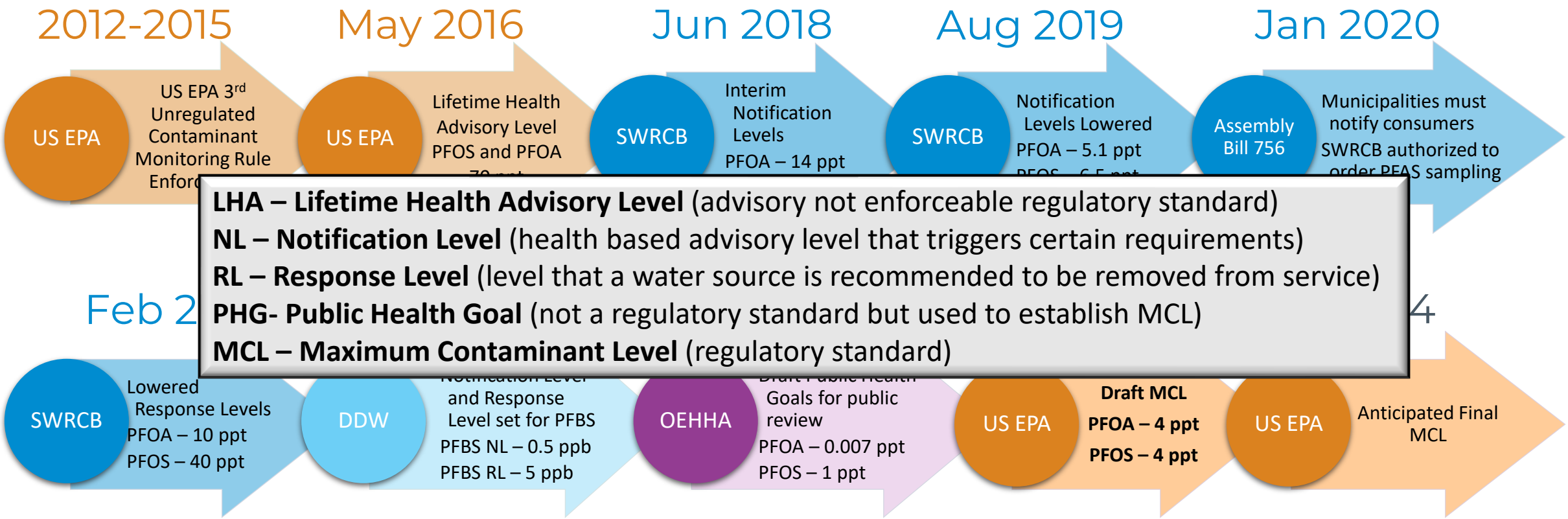
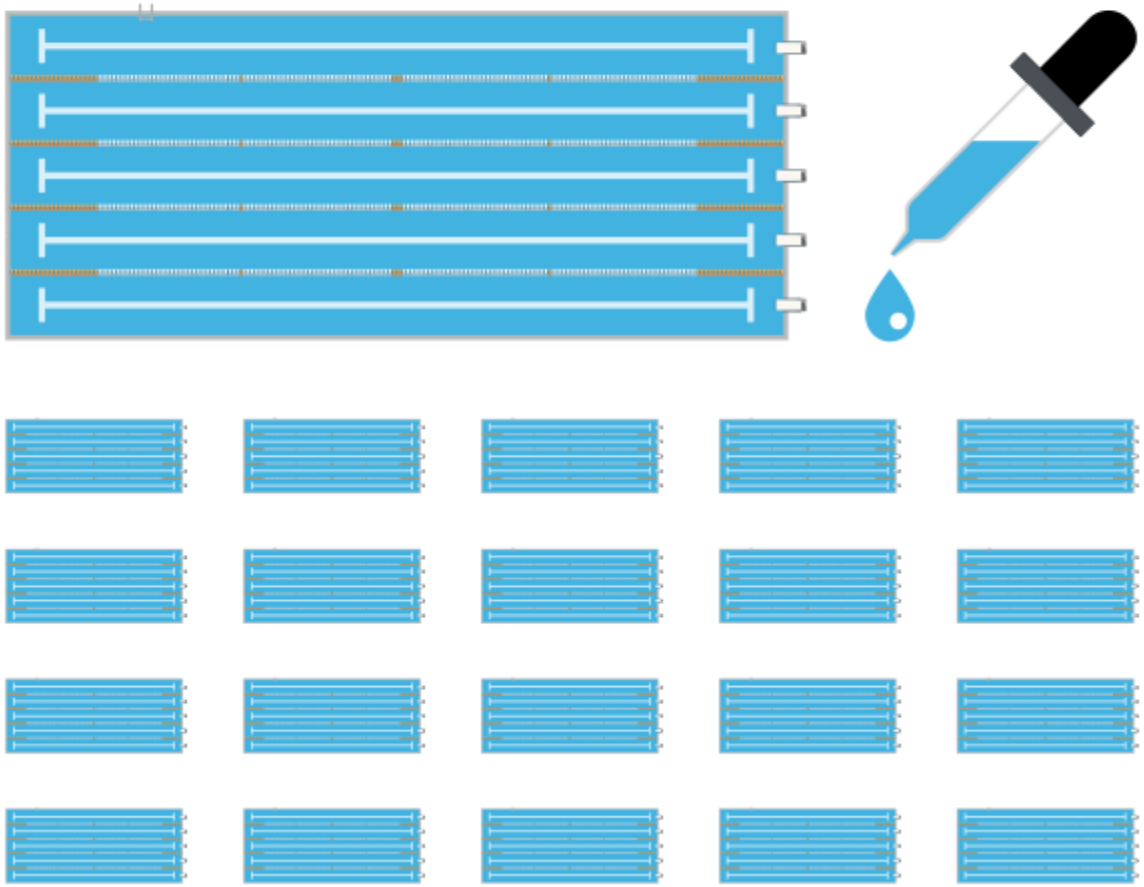
Evolving PFAs Regulations



LHA – Lifetime Health Advisory Level (advisory not enforceable regulatory standard)
NL – Notification Level (health based advisory level that triggers certain requirements)
RL – Response Level (level that a water source is recommended to be removed from service)
PHG- Public Health Goal (not a regulatory standard but used to establish MCL)
MCL – Maximum Contaminant Level (regulatory standard)

1 part per trillion (ppt)

is equivalent to a single drop of water
in 20 Olympic-sized swimming pools



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PFAS in our Groundwater

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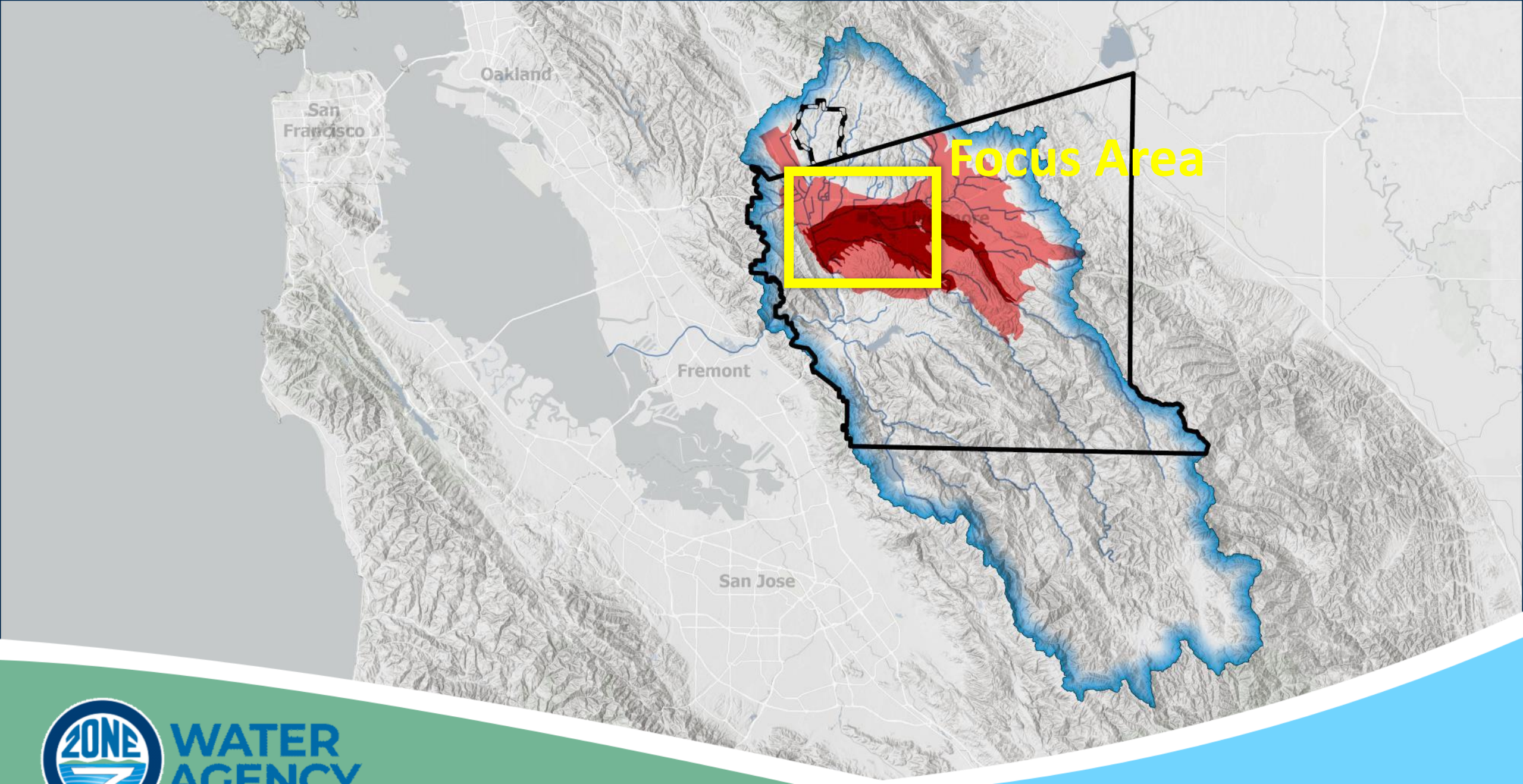

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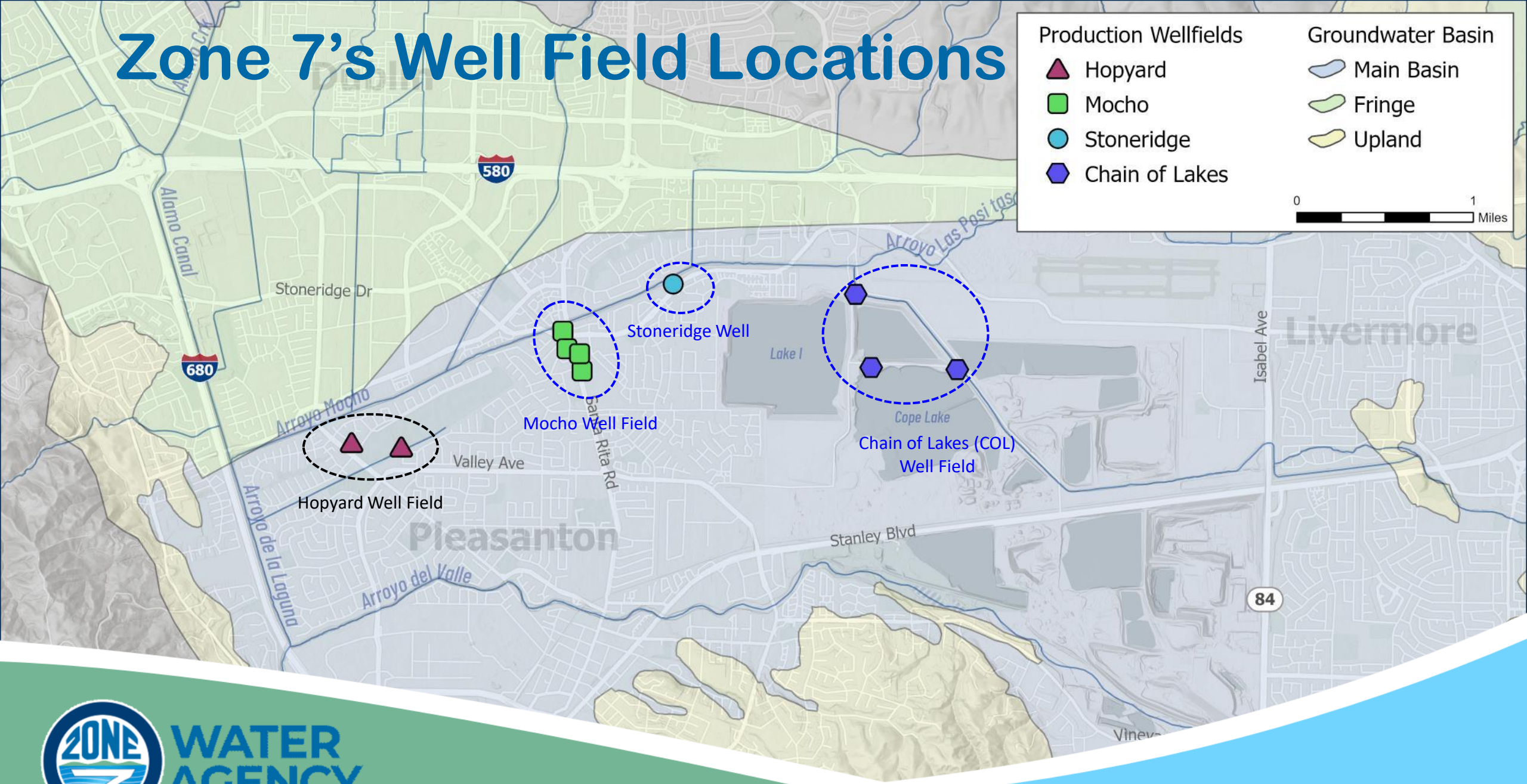
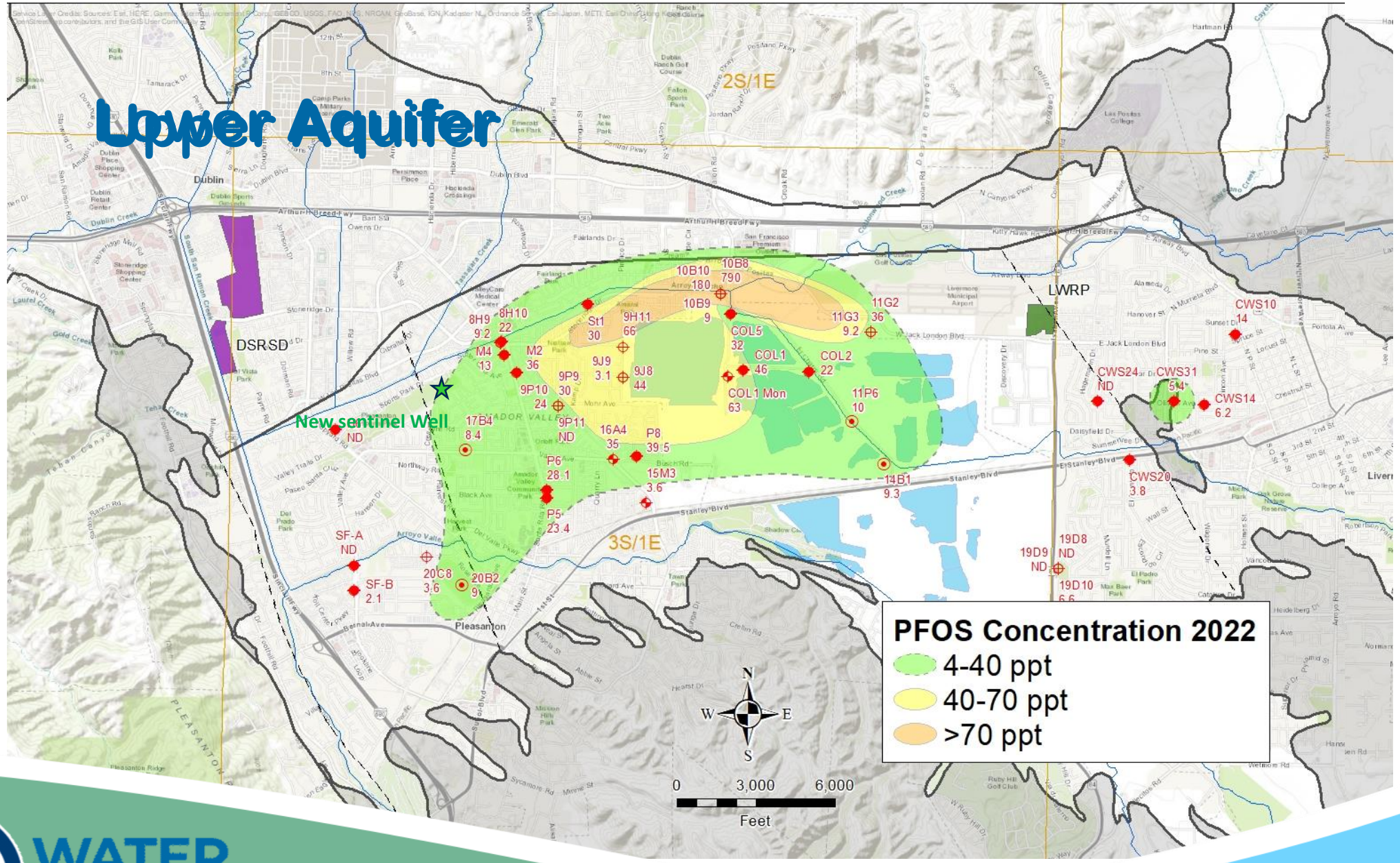
Zone 7's Well Field Locations



Upper Aquifer



Recommended PFAS Management Strategies

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Current PFAS Management Activities

- Completed PFAS Potential Source Investigation (Jacobs, 12/2020)
- Completed PFAS mobilization modeling study (Kennedy Jenks, 8/2022)
- Ongoing coordination and information sharing with retailers
- Standing meetings with the San Francisco Regional Water Quality Control Board's supply well protection team to investigate potential source(s)
- Treatment Facilities at Stoneridge (8/2023) and COL Wellfields (9/2024)

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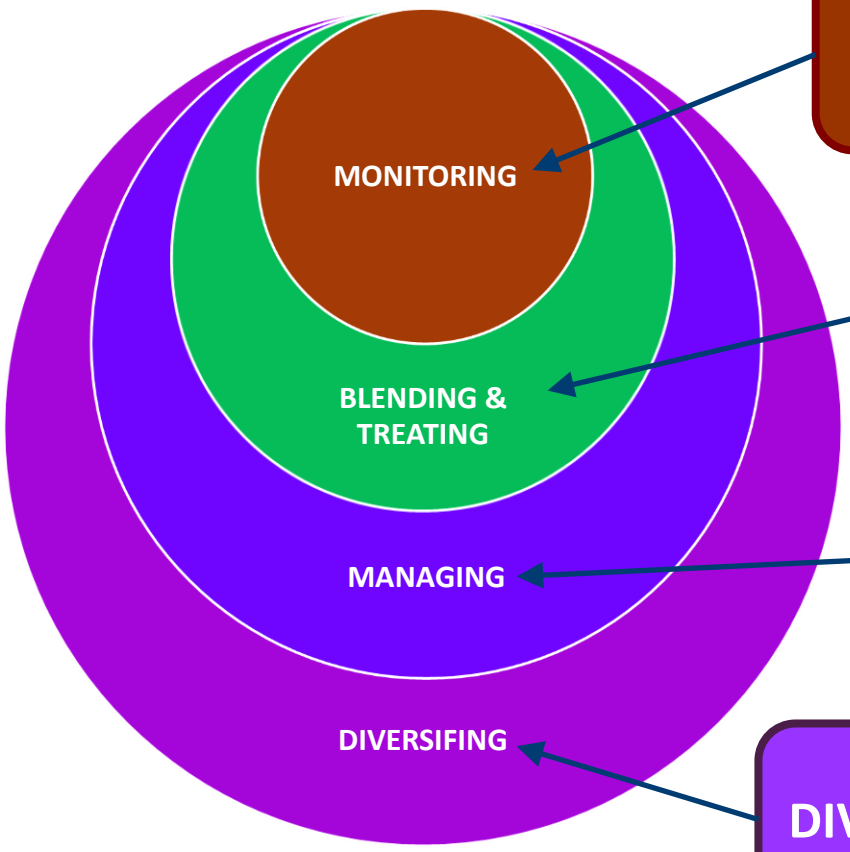
Components of Long-term Strategy (Post 2023)



MONITORING to track and manage groundwater quality

BLENDING & TREATING to meet water quality standards

MANAGING GROUNDWATER QUALITY to prevent further degradation

DIVERSIFING GROUNDWATER SOURCES to become more resilient

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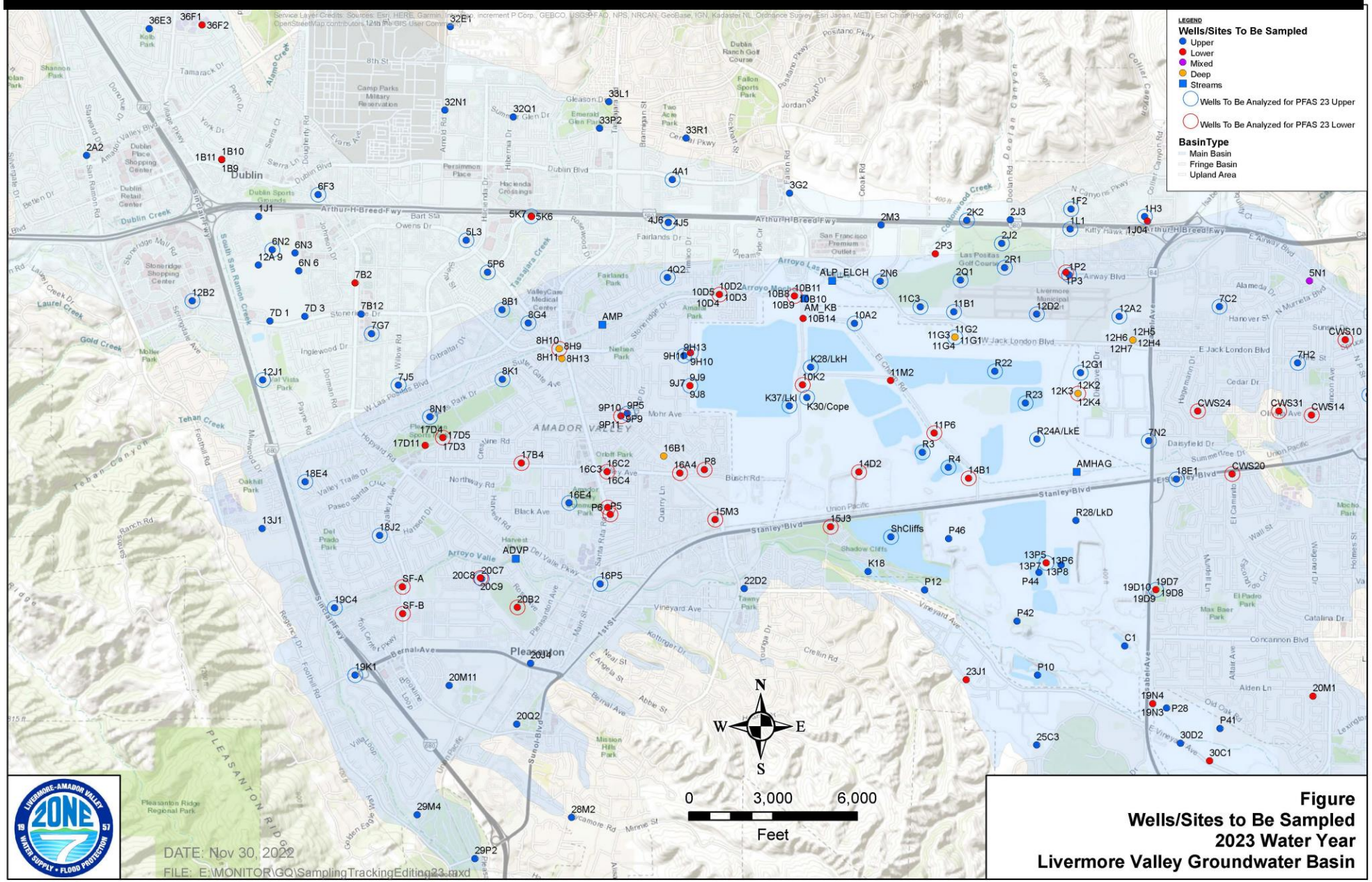
PFAS Monitoring Network



PFAS Treatment with Ion Exchange

Managing Groundwater Quality & Plume

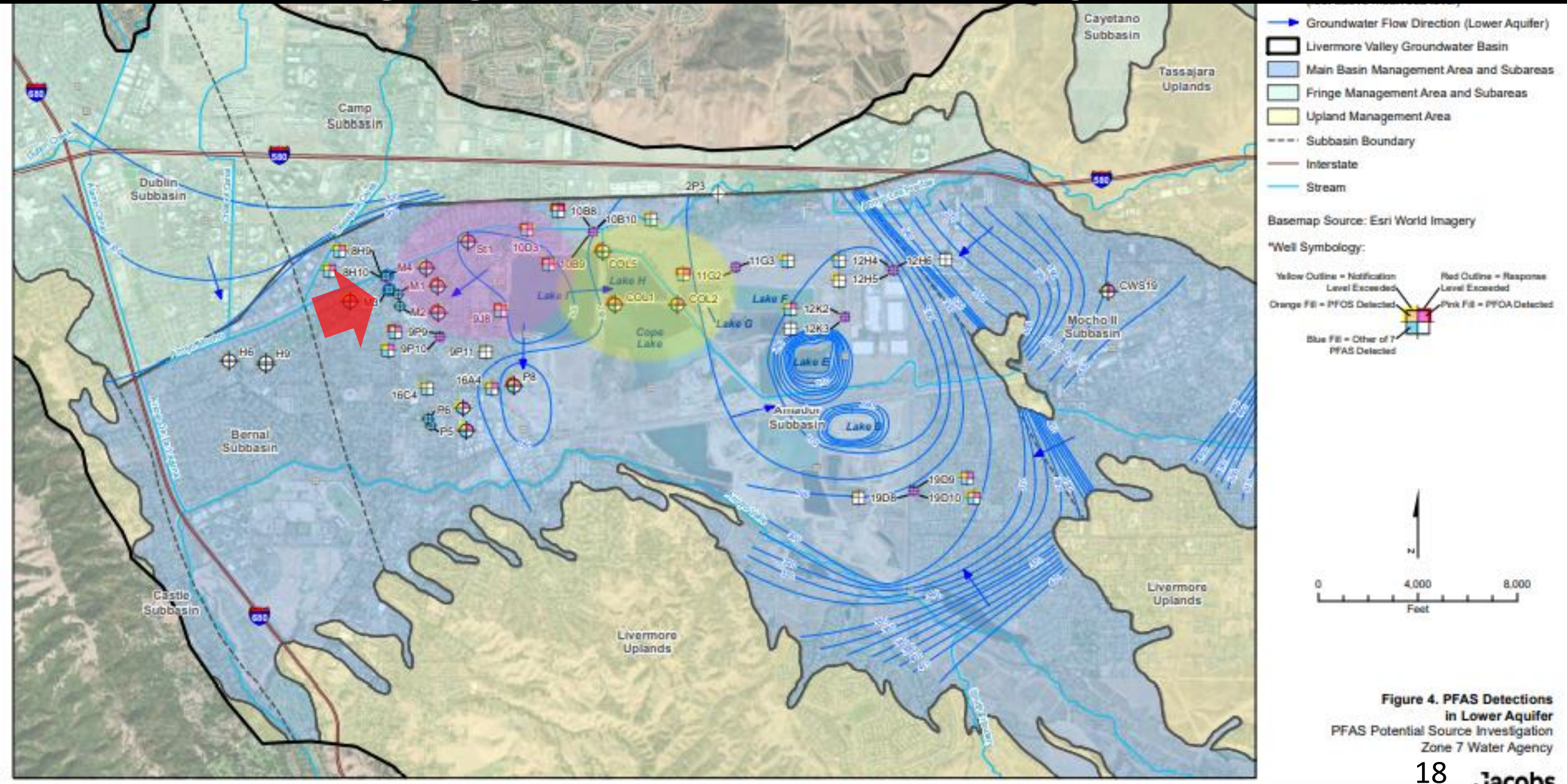
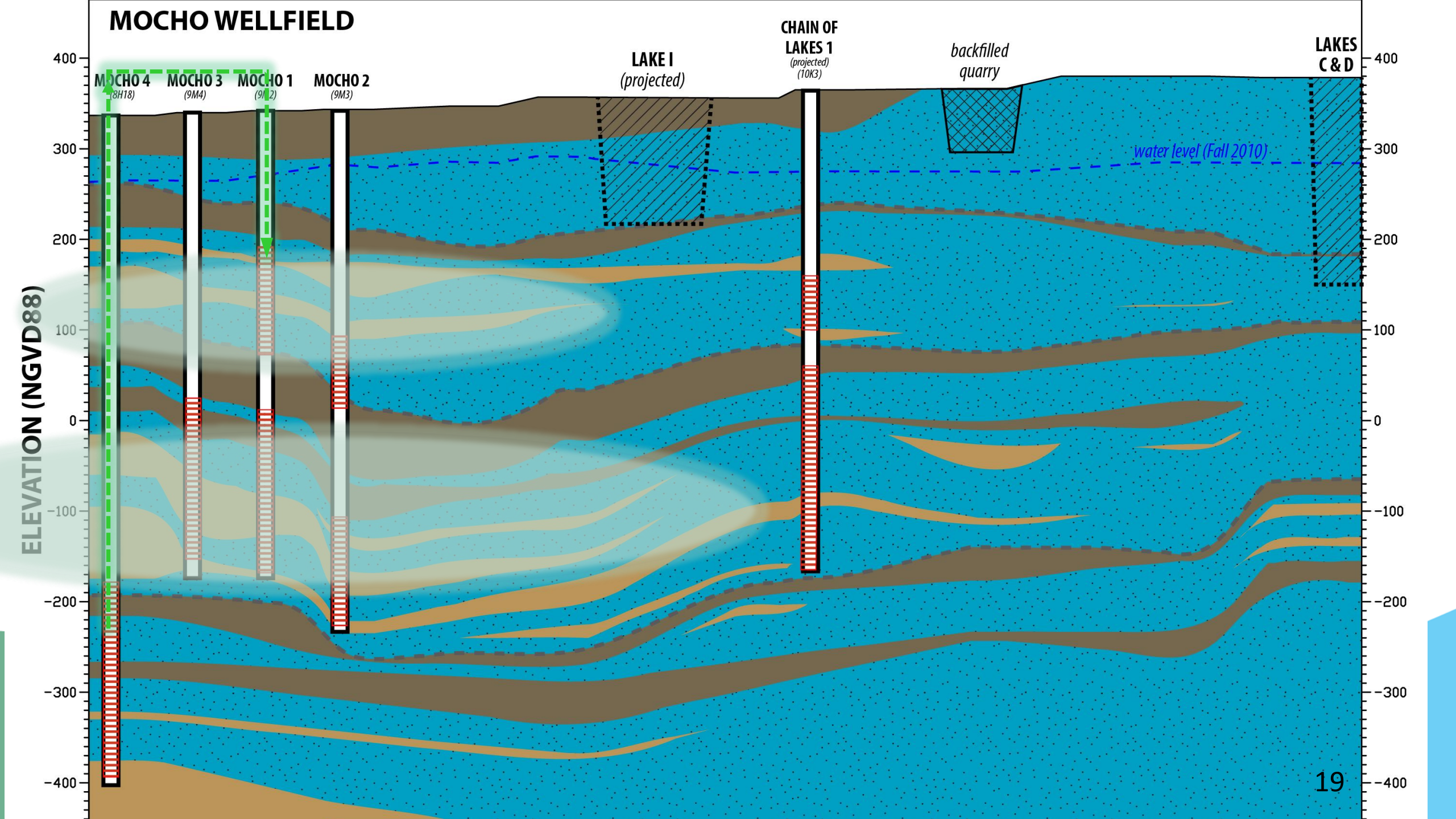


Figure 4. PFAS Detections in Lower Aquifer
PFAS Potential Source Investigation
Zone 7 Water Agency

Jacobs


MOCHO WELLFIELD
MOCHO 4
(8H18)
MOCHO 3
(9M4)
MOCHO 1
(9M2)
MOCHO 2
(9M3)
LAKE I
(projected)
CHAIN OF
LAKES 1
(projected)
(10K3)
backfilled
quarry
LAKES
C & D
water level (Fall 2010)
ELEVATION (NGVD88)
400
300
200
100
0
-100
-200
-300
-400

Next Steps

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Recommended Next Steps

1. Continue monitoring
2. Continue coordinating with the San Francisco Regional Water Quality Control Board to identify the source(s)
3. Continue with blending and treating until the MCL is established
4. Fill data gaps in the monitoring network and apply adaptive the PFAS management strategies as necessary
5. Upgrade the GW model
6. Update the Well Master Plan and develop well projects
7. Pilot-test injection via Mocho 1
8. Construct PFAS treatment facilities at the COL Wellfield and Stoneridge site
9. Pump and treat the plume when the PFAS treatment facilities become operational
10. Install **new production wells** to diversify the supply sources as per the updated Well Master Plan

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* Injection operation will take place only if Mocho well field is NOT continually operating. For injection operation, Mocho 4 will be operated intermittently

Q&A

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Back-up Slides

Scope of Stoneridge PFAS Treatment Facility Development

Media Performance Testing

- Performed the Rapid Small Scale Column Test (RSSCT)using Stoneridge water
- The purpose of the test is to identify media performance and estimate media replacement frequency
- Selected media shows approximately 1.5-2yrs of service before changeout; ~$150k/yr in media costs

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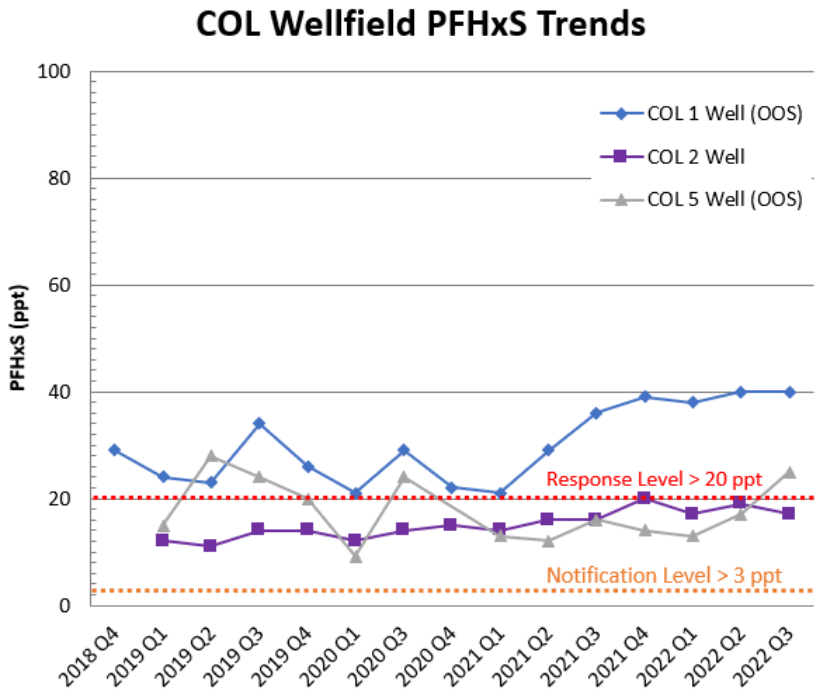
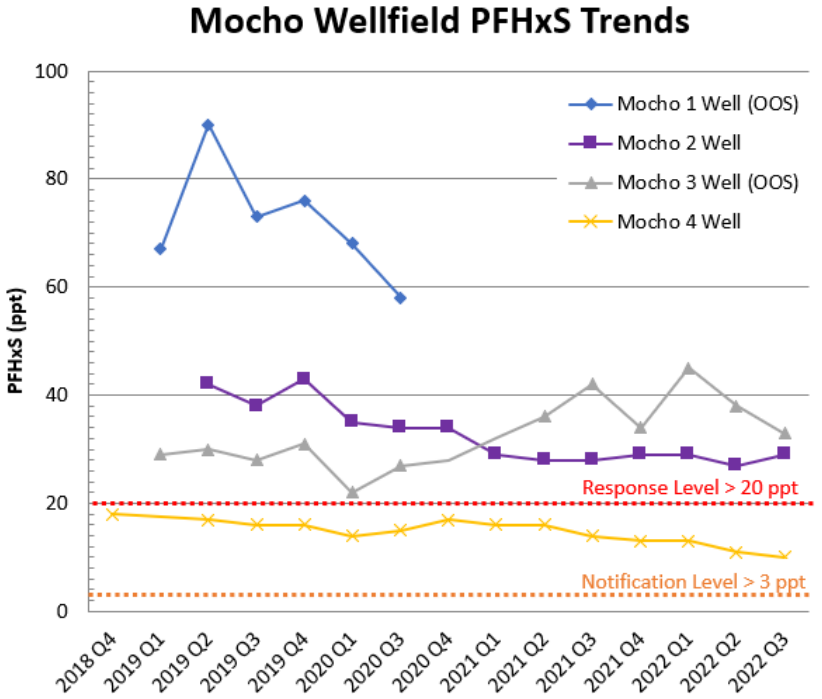
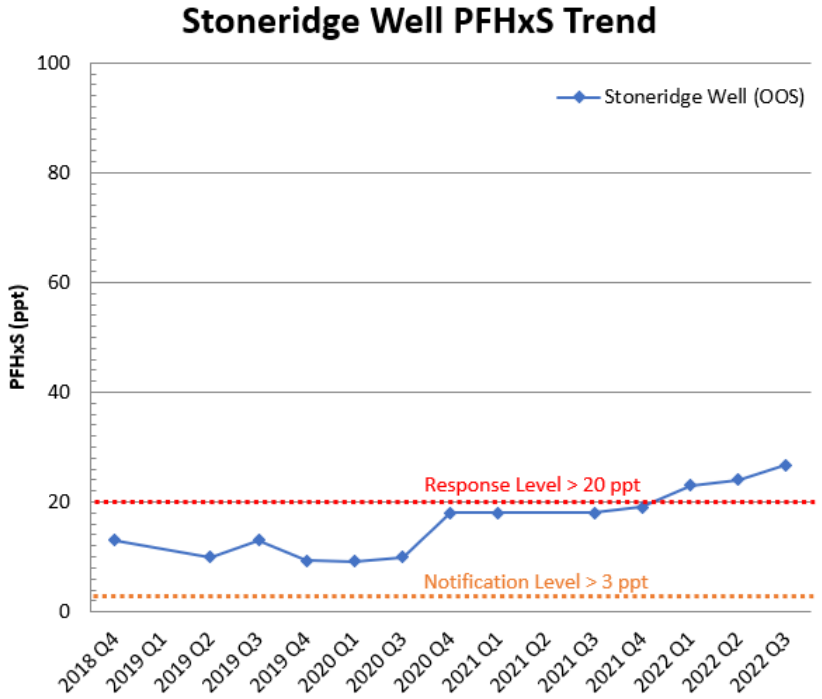
Current PFHxS Trends







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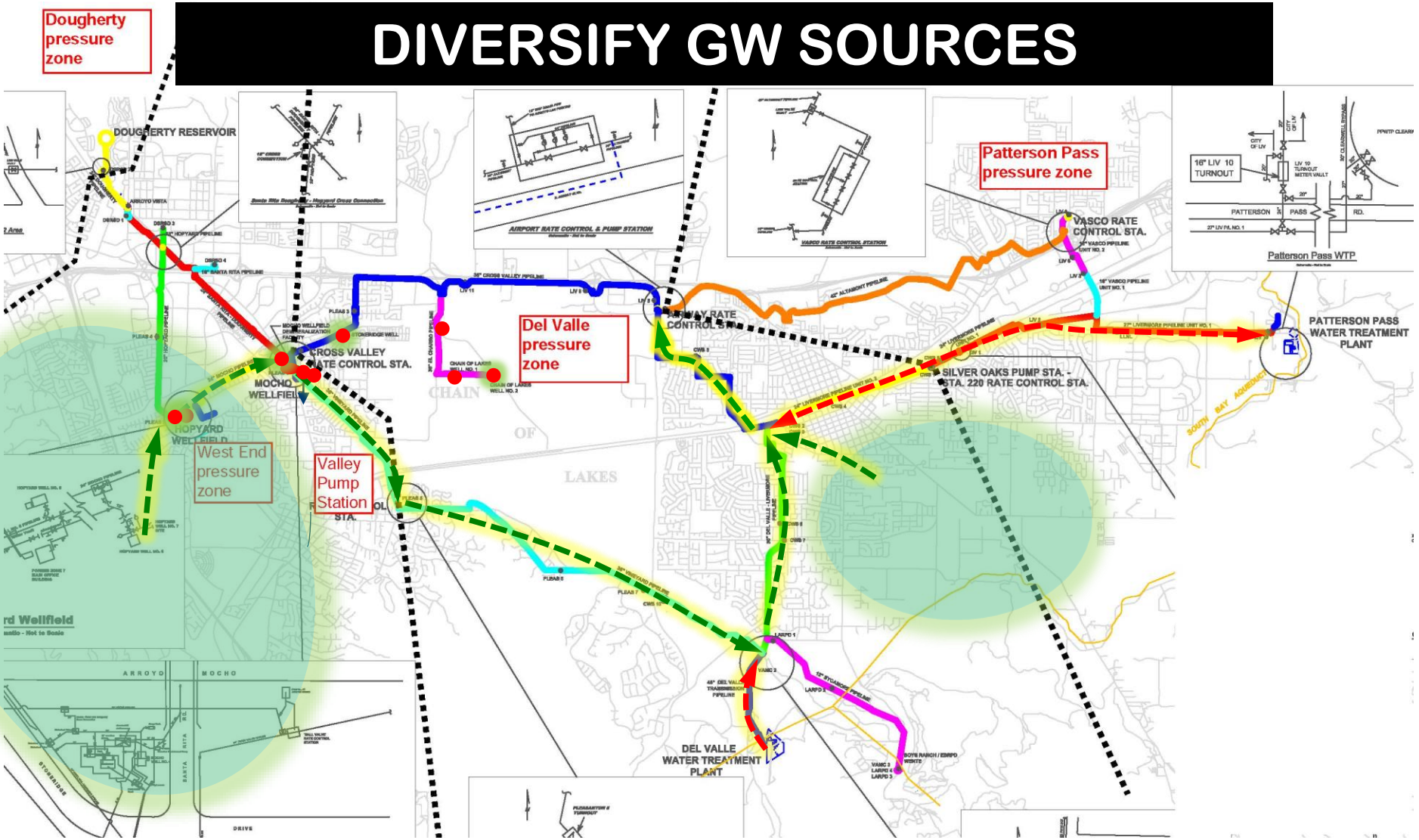
DIVERSIFY GW SOURCES



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