Regulatory Updates from the Department of Toxic Substances Control (DTSC)

Site Assessment and Mitigation Program (SAM) Forum
County of San Diego
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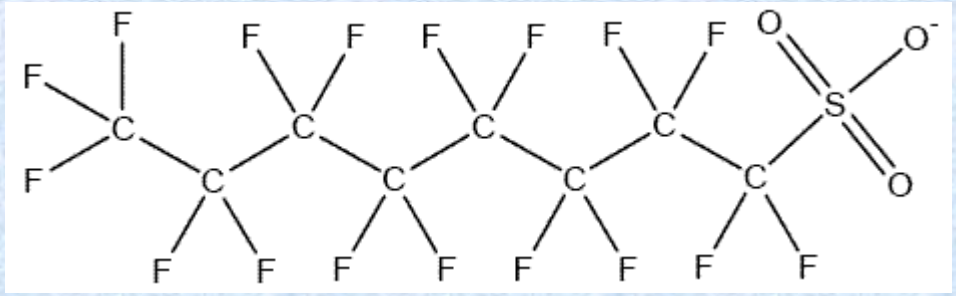
Topics

- Perfluoro and polyfluoroalkyl substances (PFAS)
- HHRA Note 8 on Polychlorinated Biphenyls (PCBs)
- Toxicity Criteria Regulation

Perfluoro and Polyfluoroalkyl Substances (PFAS)

PFAS: Synthetic chemicals characterized by fluorine atoms attached to a carbon chain. They are valued for their chemical stability and their oil, water and stain repellant properties

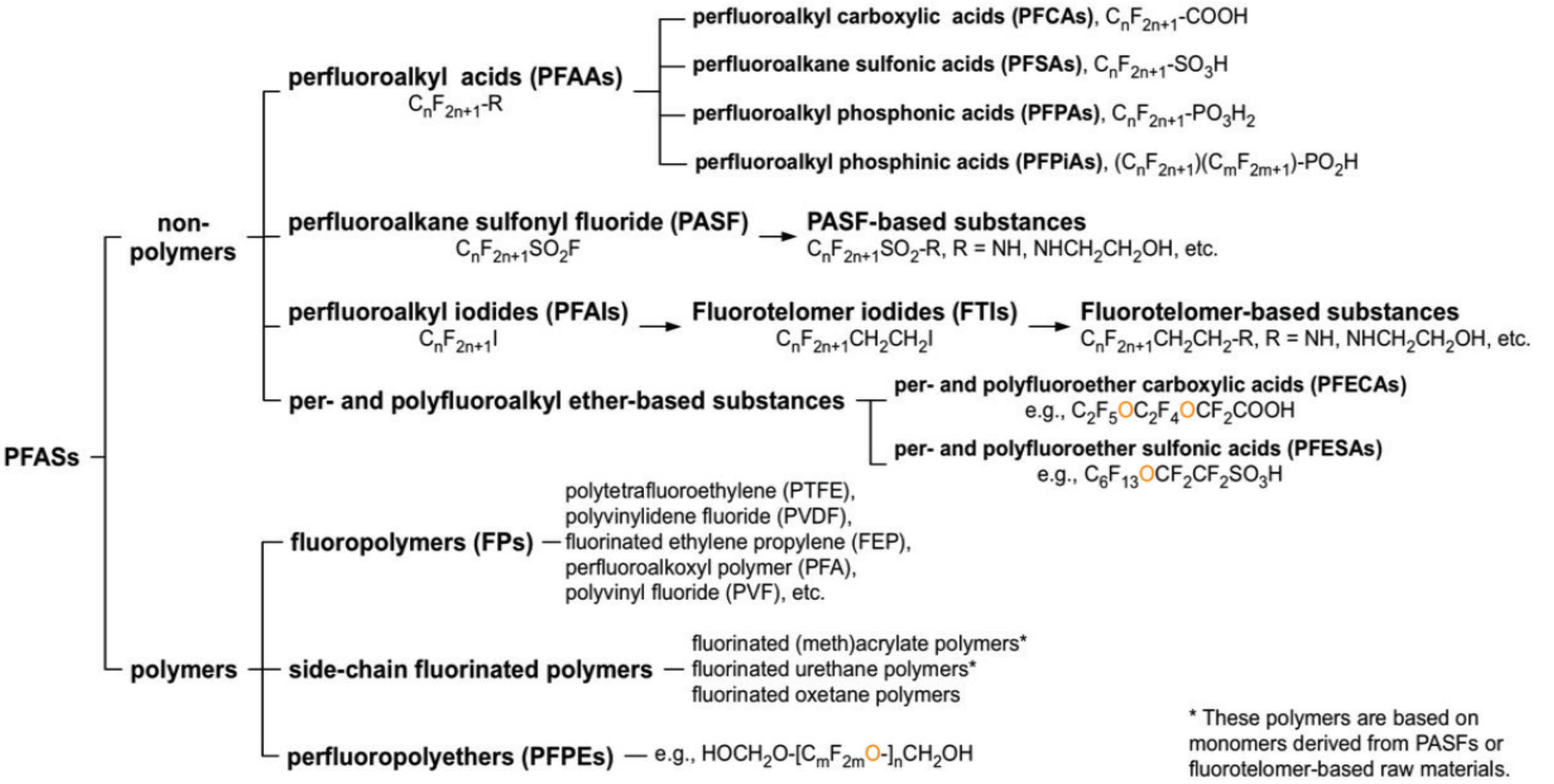
PFOS ($C_8HF_{17}O_3S$)



- Industrial uses:
  - Automotive, aerospace, construction, electronics

- Found in many products
  - Class B firefighting foams
  - Non-stick cookware
  - Food containers
  - Consumer products (stain-proof fabrics and carpets, rain gear, personal care products, detergents)

Per- and polyfluoroalkyl substances (PFASs)

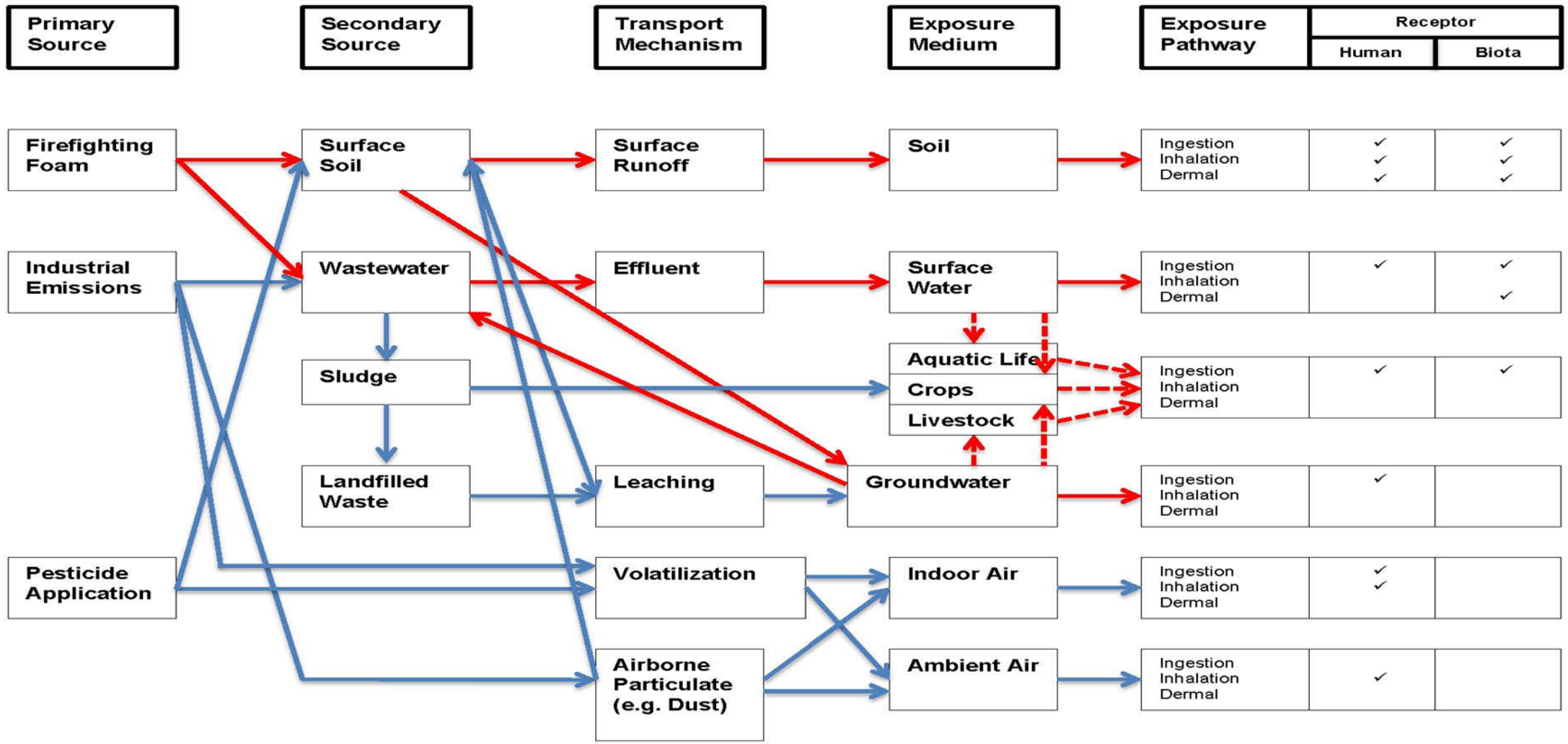


* These polymers are based on monomers derived from PASFs or fluorotelomer-based raw materials.

Why are PFAS compounds of concern?

- **Widespread use:** Industry and consumer products
- **Persistent:** Does not break down easily in the environment
- **Bioaccumulates in humans and animals:** Found in more than 90% of the US population sampled (NHANES studies)
- **Ground water contamination:** Found in public drinking water sources
- **Concerns about health effects:**
  - affect growth, learning, and behavior of infants and older children
  - interfere with the body's natural hormones
  - increase cholesterol levels
  - affect the immune system and
  - increase the risk of cancer

Fate and Transport Model for PFASs in the Environment



Perfluoro and Polyfluoroalkyl Substances (PFAS): Environmental Investigations (Cleanup Program)

- Federal Facility Sites (DoD)
  - Reviewed Work Plans for 12 current or former bases (14 PFASs were measured)
  - Received initial sampling results
  - Reviewing Site Inspection reports
  - PFASs detected in groundwater, wastewater treatment plant influent/effluent, and soil
- Industrial facilities
- Expanding the focus to other sites
  - Wastewater treatment plants
  - Major industrial sites
  - AFFF-certified airports
  - Tanneries
  - Landfills
  - Plating Facilities

DTSC – Environmental Investigations (Cleanup Program)

Current Recommended DTSC Screening Levels (SLs)

Table 1. Health-Based Drinking Water[1]	
EPA Health Advisory (HA) (µg/L)	
PFOA	PFOS
0.07	0.07
PFOA + PFOS = 0.07	

Table 2. DTSC Risk-Based Residential SLs[2]	
Soil (mg/kg)	
PFOA	PFOS
1.3	1.3

[1]USEPA lifetime drinking water health advisory level issued May 2016.

[2]DTSC-SLs calculated using DTSC recommended default exposure parameters and the RfD from the USEPA PFOA and PFOS HA.

Tapwater Risk-Based SL

For risk assessment purposes, the tapwater risk-based DTSC-SL

Table 3. DTSC Risk-Based Residential SLs[2]	
Tapwater (µg/L)	
PFOA	PFOS
0.4	0.4

DTSC – Environmental Investigations (Cleanup Program)

- Next Steps for Risk Assessment
  - DoD finishing site investigations – Is there PFAS contamination?
  - Discussions with DoD on how to conduct a risk assessment at sites with known PFAS contamination in soil, groundwater and wastewater treatment plants
    - USEPA's RSL table does not list soils/water screening levels for PFOS/PFOA
    - Toxicity values for two other PFASs are listed on RSL table (Perfluorobutane sulfonic acid, Perfluorobutanesulfonate)
  - One base installed activated carbon at wastewater treatment plant
- Recommendation at one Site –
  - Yes to "Further Response Actions - pending promulgated regulations"

Challenges and Ongoing Research

- Address the lack of toxicity criteria for all PFASs:
  - Responsive Evaluation and Assessment of Chemical Toxicity (REACT) – Collaborative program between NTP and USEPA to screen as many as 75 PFASs (identified by grouping similar compounds) through high throughput screening assays- initial *in vitro* and *in silico* methods, followed by select in vivo methods to generate information.
- How to perform risk assessments:
  - A relative potency factor approach, similar to dioxin evaluation (proposed by RIVM of the Netherlands)
- Address uncertainties around the current toxicity criteria
- How to pinpoint the source of contamination - Found in almost everything

Human Health Risk Assessment (HHRA) Note Number 8: Recommendations for Evaluating Polychlorinated Biphenyls (PCBs) at Contaminated Sites in California

C.Y. Jeng, Efrem Neuwirth, and Shukla Roy-Semmen

Human and Ecological Risk Office (HERO)

Why was HHRA Note 8 developed?

- To document lessons learned from HERO's recent interactions with the USEPA Region 9 regarding evaluation of PCBs at sites in California.
- To memorialize key risk assessment recommendations provided in time-critical support of PCB releases by DTSC.
  - PCB Advisory for Schools: How Voluntary Lighting Retrofits Can Address Hidden Dangers (2003; currently being updated)
- To utilize funding from the DTSC State Response Program (SRP) grant to prepare a resource document for DTSC staff and external stakeholders.

What is HHRA Note 8 about?

- Present common technical issues and recommendations related to **<u>evaluating exposures and health risks of PCBs</u>** at contaminated sites in California:
  - ✓Regulatory framework
  - ✓Sample collection
  - ✓Analytical methods
  - ✓Data evaluation
  - ✓Toxicity factors/risk assessment
  - ✓Threshold concentrations & cleanup goals

What is HHRA Note 8 not about?

- Not DTSC policy or regulatory requirements
- Supplement but does not replace other DTSC guidance documents
- Does not address other site characterization and risk management issues (e.g., cleanup methods, risk communication)
- Does not provide guidance on ecological hazards (consult with HERO Ecological Risk Assessment Section)
- Does not substitute requirements under the Toxic Substances Control Act (TSCA) and other USEPA regulations.

When to use HHRA Note 8?

- Define the scope of work for the project
- Develop the conceptual site model (CSM) and data quality objectives (DQOs)
- Select appropriate screening levels to use
- Gather information to support health risk evaluation
- Establish action levels and/or cleanup goals (not site-specific)
- Learn basics about TSCA and USEPA's role on managing PCB materials/wastes

Table 3.1 Available Sample Types for Evaluating Exposures and Health Risks

SAMPLE TYPE	EXPOSURE PATHWAYS EVALUATED		
	Ingestion	Dermal	Inhalation
Soil or outdoor dust (a)	X (c)	X (c)	X (c)
Wipes (b)	X (d)	X (d)	(f)
indoor dust (a)	X (c)	X (d)	(f)
Chips and cores (a)	X (e)	X (e)	(f)
Air (a)	na	na	X (c)

Notes: This table includes possible sample types and potentially complete exposure pathways (na: not applicable). For a specific site, the CSM will be used to determine which samples will be collected and which exposure pathways will be evaluated.

(a) Units in milligrams or micrograms of PCBs per kilogram (for soil, bulk dust and chip/core samples) or per cubic meter (for air samples).

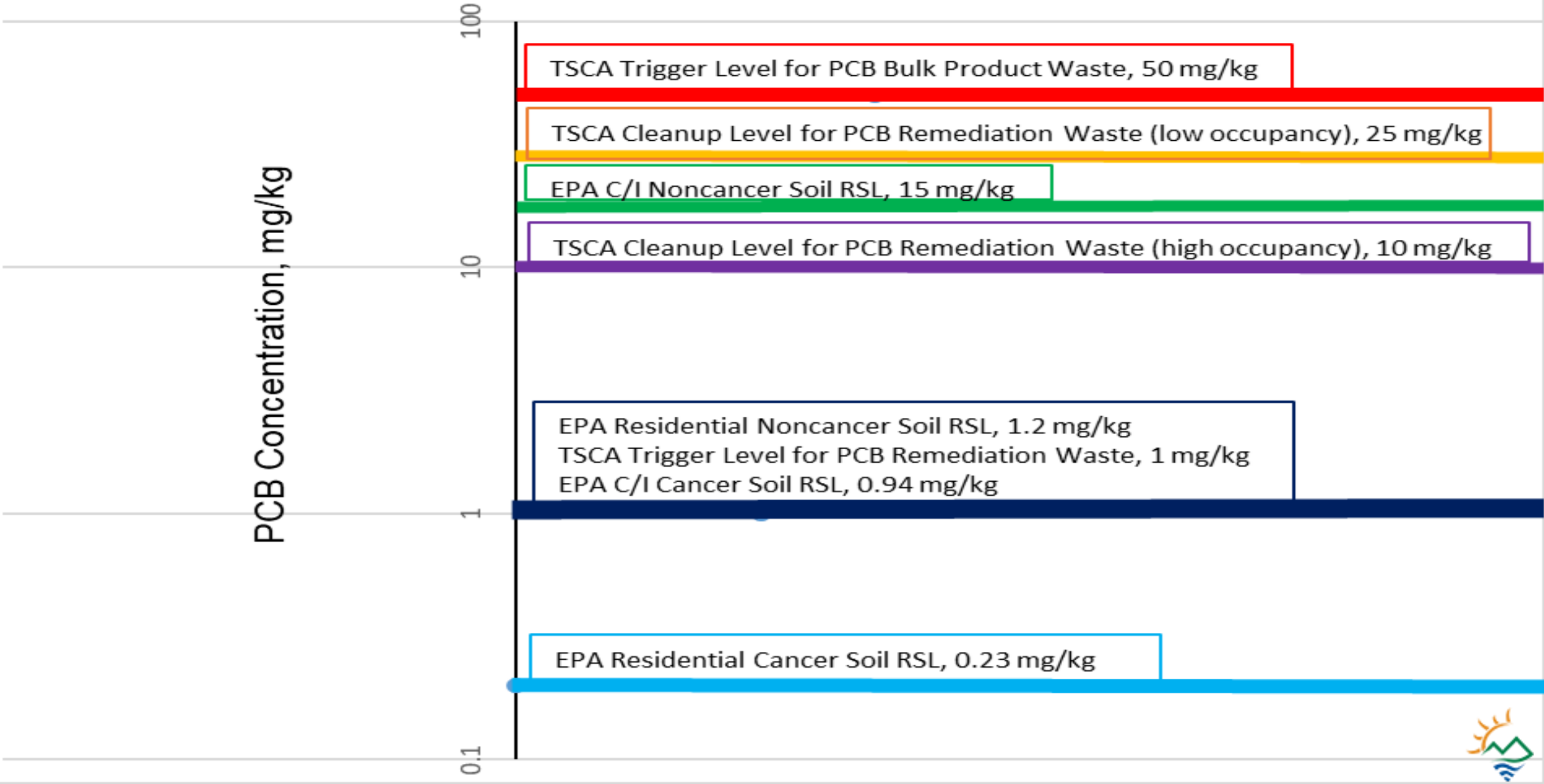
(b) Units in micrograms PCBs per unit surface area (typically 100 square centimeters with a wipe).

Table 4.1 Common Laboratory Methods for PCB Analysis

Analysis	Method	Estimated Cost	Typical Reporting Limit
Aroclors	EPA 8082 (GC-ECD*)	Low ($50-150/sample)	~ 33 µg/kg (solid) ~ 1 µg/L (aqueous)
Homologs	EPA 680/8270 (GC-LRMS*)	Medium (~$400/sample)	~ 1 µg/kg (solid) ~0.1 µg/L (aqueous)
Congeners	EPA 1668 (HRGC-HRMS*)	High ($400-1000/sample)	~ 0.002 µg/kg (solid) ~ 0.00002 µg/L (aqueous)

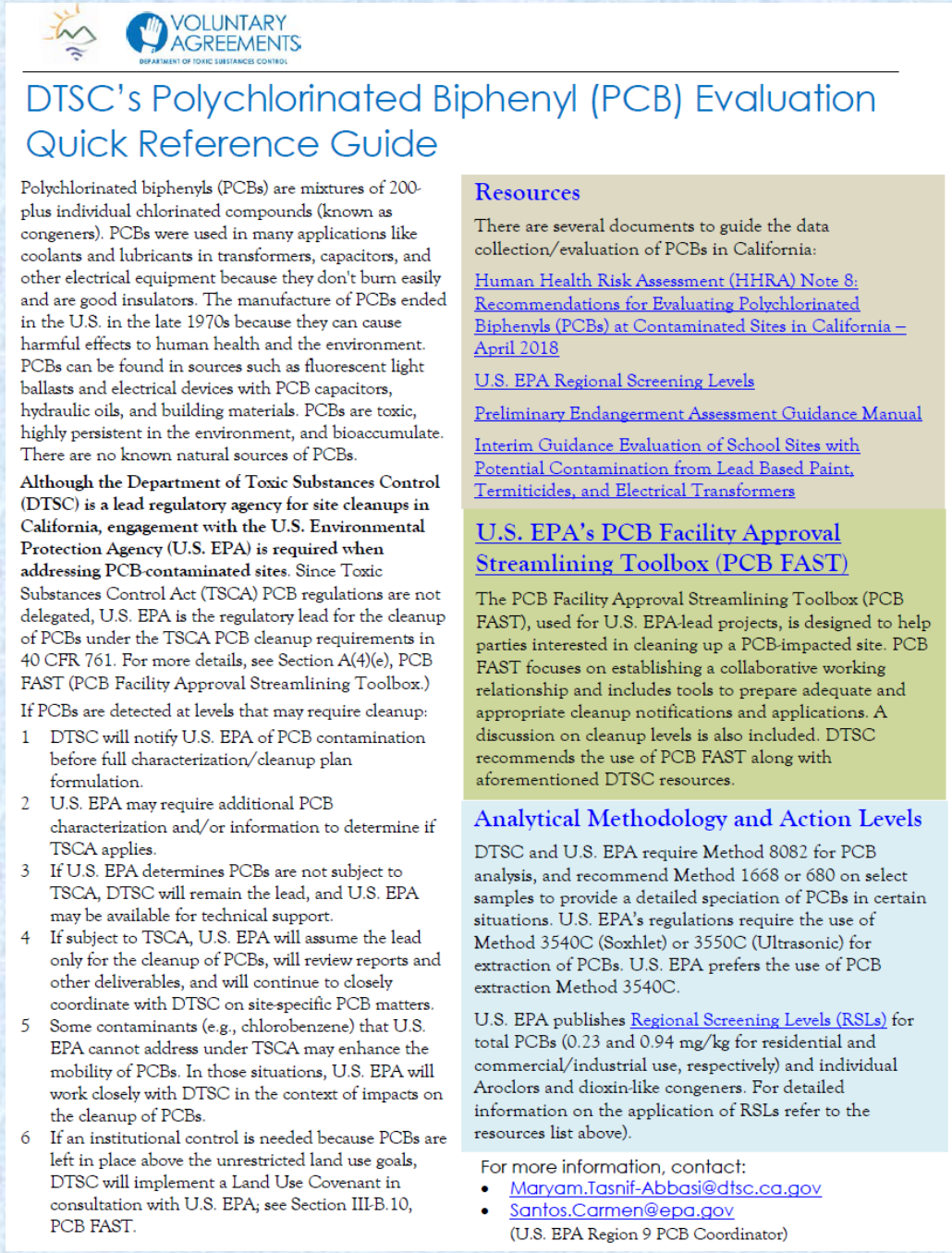
*GC-ECD: gas chromatography - electron capture detector
GC-LRMS: gas chromatography - low resolution mass spectrometry
HRGC-HRMS: high resolution gas chromatography - high resolution mass spectrometry

Figure 7.1 Regulatory Threshold Values for PCBs



Additional Resources

- DTSC (VCA Program), Polychlorinated Biphenyl (PCB) Evaluation Quick Reference Guide (2018)
- DTSC, PCB Advisory for Schools: How Voluntary Lighting Retrofits Can Address Hidden Dangers (June 2003; being updated)
- USEPA, PCB Facility Approval Streamlining Toolbox (FAST) – A Framework for Streamlining PCB Site Cleanup Approvals (May 2017)



VOLUNTARY AGREEMENTS
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

DTSC's Polychlorinated Biphenyl (PCB) Evaluation Quick Reference Guide

Polychlorinated biphenyls (PCBs) are mixtures of 200-plus individual chlorinated compounds (known as congeners). PCBs were used in many applications like coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs ended in the U.S. in the late 1970s because they can cause harmful effects to human health and the environment. PCBs can be found in sources such as fluorescent light ballasts and electrical devices with PCB capacitors, hydraulic oils, and building materials. PCBs are toxic, highly persistent in the environment, and bioaccumulate. There are no known natural sources of PCBs.

Although the Department of Toxic Substances Control (DTSC) is a lead regulatory agency for site cleanups in California, engagement with the U.S. Environmental Protection Agency (U.S. EPA) is required when addressing PCB-contaminated sites. Since Toxic Substances Control Act (TSCA) PCB regulations are not delegated, U.S. EPA is the regulatory lead for the cleanup of PCBs under the TSCA PCB cleanup requirements in 40 CFR 761. For more details, see Section A(4)(e), PCB FAST (PCB Facility Approval Streamlining Toolbox.)

If PCBs are detected at levels that may require cleanup:

1 DTSC will notify U.S. EPA of PCB contamination before full characterization/cleanup plan formulation.
2 U.S. EPA may require additional PCB characterization and/or information to determine if TSCA applies.
3 If U.S. EPA determines PCBs are not subject to TSCA, DTSC will remain the lead, and U.S. EPA may be available for technical support.
4 If subject to TSCA, U.S. EPA will assume the lead only for the cleanup of PCBs, will review reports and other deliverables, and will continue to closely coordinate with DTSC on site-specific PCB matters.
5 Some contaminants (e.g., chlorobenzene) that U.S. EPA cannot address under TSCA may enhance the mobility of PCBs. In those situations, U.S. EPA will work closely with DTSC in the context of impacts on the cleanup of PCBs.
6 If an institutional control is needed because PCBs are left in place above the unrestricted land use goals, DTSC will implement a Land Use Covenant in consultation with U.S. EPA; see Section III-B.10, PCB FAST.

Resources

There are several documents to guide the data collection/evaluation of PCBs in California:

Human Health Risk Assessment (HHRA) Note 8: Recommendations for Evaluating Polychlorinated Biphenyls (PCBs) at Contaminated Sites in California – April 2018

U.S. EPA Regional Screening Levels

Preliminary Endangerment Assessment Guidance Manual

Interim Guidance Evaluation of School Sites with Potential Contamination from Lead Based Paint, Termiticides, and Electrical Transformers

U.S. EPA's PCB Facility Approval Streamlining Toolbox (PCB FAST)

The PCB Facility Approval Streamlining Toolbox (PCB FAST), used for U.S. EPA-lead projects, is designed to help parties interested in cleaning up a PCB-impacted site. PCB FAST focuses on establishing a collaborative working relationship and includes tools to prepare adequate and appropriate cleanup notifications and applications. A discussion on cleanup levels is also included. DTSC recommends the use of PCB FAST along with aforementioned DTSC resources.

Analytical Methodology and Action Levels

DTSC and U.S. EPA require Method 8082 for PCB analysis, and recommend Method 1668 or 680 on select samples to provide a detailed speciation of PCBs in certain situations. U.S. EPA's regulations require the use of Method 3540C (Soxhlet) or 3550C (Ultrasonic) for extraction of PCBs. U.S. EPA prefers the use of PCB extraction Method 3540C.

U.S. EPA publishes Regional Screening Levels (RSLs) for total PCBs (0.23 and 0.94 mg/kg for residential and commercial/industrial use, respectively) and individual Aroclors and dioxin-like congeners. For detailed information on the application of RSLs refer to the resources list above).

For more information, contact:

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- Santos.Carmen@epa.gov
  (U.S. EPA Region 9 PCB Coordinator)

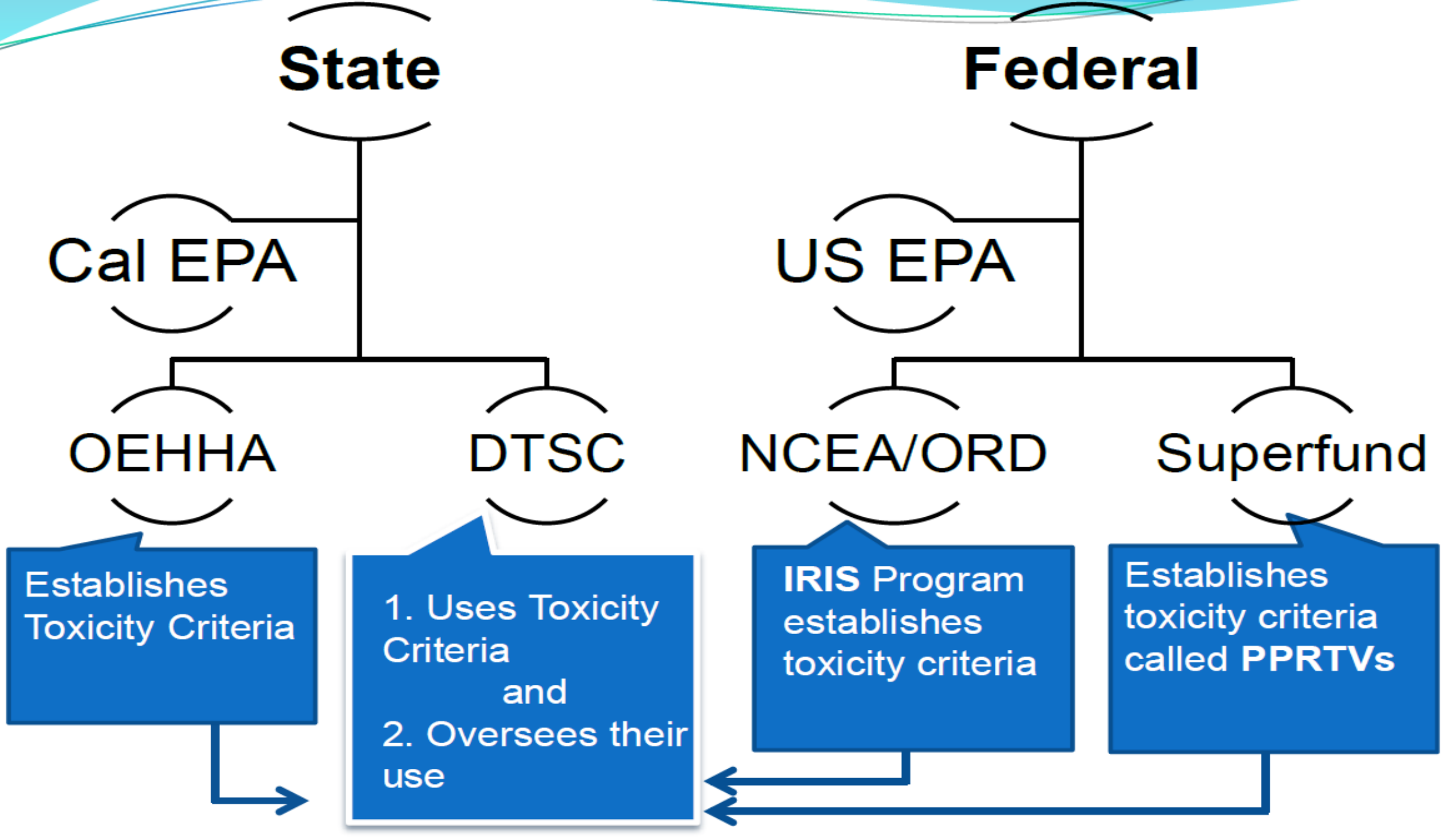
Toxicity Criteria Regulation

Goals

- Ensure toxicity criteria are consistently applied and used at **all** California sites
- Ensure protection of the entirety of California's diverse population (age, race, culture, income levels)
- Establish an Applicable or Relevant and Appropriate Requirement (ARAR) that will apply to all Federal California sites

Toxicity Criteria Regulation

- Specifies Toxicity Criteria for Risk Assessments, Screening Levels and Remediation Goals
- Applies to all Hazardous Waste & Hazardous Substance Cleanup Sites in California
- Codifies existing practice
- Adds Sections to Division 4.5, Title 22 of the Code of Federal regulations
- Consistent with California Health and Safety Code section 25356.1.5
- Rule is effective September 4, 2018


State
Federal
Cal EPA
US EPA
OEHHA
DTSC
NCEA/ORD
Superfund
Establishes Toxicity Criteria
1. Uses Toxicity Criteria
and
2. Oversees their use
IRIS Program establishes toxicity criteria
Establishes toxicity criteria called PPRTVs

Toxicity Criteria Regulation

- Rule is effective September 4, 2018
- Applies to all Hazardous Waste & Hazardous Substance Cleanup Sites in California
- Specifies the following order for the source of toxicity criteria:
  1. OEHHA's peer-reviewed toxicity criteria listed in Appendix I of the Rule
  2. U.S. EPA IRIS toxicity criteria
  3. Values from other sources

Toxicity Criteria Regulation

Specifies the following order for the source of toxicity criteria:

1. OEHHA's peer-reviewed toxicity criteria listed in Appendix I of the Rule
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	PCE Indoor Air Screening Levels ($\mu g/m^3$)	
	Residential	Commercial/ Industrial
OEHHA Toxicity Criteria	**0.46**	**2**
IRIS Toxicity Criteria	11	47
Difference	23-Fold	

QUESTIONS?