BACWA Pesticide Workgroup: Annual Update to BAPPG

Stephanie Hughes, P.E.

January 29, 2025

Introduction to Your Speaker

- Chemical Engineer with more than 30 years of experience in chemical fate and transport, water quality, and regulatory compliance.
- Relevant prior positions:
  - Source Control Manager, City of Palo Alto
  - Senior Engineer, Woodard and Curran
- Current roles:
  - Water Quality Consultant, supporting BAPPPG/BACWA and CASQA
  - Teaching Professor, Environmental Science, Santa Clara University

The newspaper of Silicon Valley

The Mercury

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'SQUIRREL-PALOOZA'

NHAT V. MEYER — STAFF PHOTOGRAPHER

Stephanie Hughes, a volunteer at Wildlife Center of Silicon Valley, feeds a baby eastern gray squirrel at the center in San Jose on Thursday.

We will highlight three 2024 topic areas

1. Regulatory communication with EPA, DPR and DTSC
2. Update of workgroup goals and pesticide priorities
3. Continued outreach regarding on-pet pesticides culminating in proposed regional workplan

Pesticide Discharges to the Sewer Can Harm the Environment and Be Costly

- Potential to cause or contribute to wastewater treatment process interference
- Adverse impacts to receiving waters
- Permit compliance issues
- Exposes cities to the potential for third party lawsuits under the Federal Clean Water Act (CWA)
- Degrade recycled water quality and/or ability to reuse biosolids

Regulatory Communications 2024

EPA:

- Submitted 3 comment letters to EPA
  - Neonics
  - IPBC
  - Pesticide labels
- Made a public comment at EPA's Endangered Species Act Insecticide meeting
- Coordinated with NACWA, resulting in NACWA submitting 3 comment letters to EPA

DPR and DTSC:

- Met with the DPR Surface Water team
- Spoke with the DPR neonic re-evaluation team multiple times
- Submitted 1 comment letter to DPR in support of pesticide model update
- Submitted 1 comment letter to DTSC on its Priority Product Work Plan

Regulatory Tracking for 2025

EPA:

- EPA's proposal to move on-pet pesticide authority to FDA (uncertain if this will occur)
- EPA's effort to coordinate Office of Pesticide Programs (OPP) with Office of Water (OW) and Clean Water Act
- Project 2025

DPR and DTSC:

- DPR's re-evaluation of neonics for non-production outdoor ornamental plants, trees, and turfs (required by AB363)
- DPR's final draft of imidacloprid re-evaluation (Just released!)
- Opportunities to work with DPR (Sustainable Pest Management) and DTSC (Safer Consumer Products)

What are your questions?



As we seek to engage more deeply with DPR and DTSC, we sought to first internally clarify the Workgroup goals

1. Prevent effluent toxicity / Protect wastewater and recycled water quality
   - Protecting affordability and feasibility of reuse (potable and non-potable)
2. Prevent (Avoid) process interference / Ensure process operations
3. Prevent challenges with biosolids disposal / Protect biosolids reuse

Our scientific Pesticide Prioritization Process leads to our top concerns moving forward

General Scientific Approach

Level of Threat to BACWA's Goals = Pesticide Hazard + Pesticide Exposure

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Pesticide Strategy

Assess Pesticide Active Ingredients (Hazards)

BACWA's Primary Tools

BACWA Pesticide Watchlist

Pesticides that have available toxicity, and monitoring data and have been evaluated by BACWA

Used for Prioritizing pesticides on a chemical basis

BAPPG/BACWA Wastewater Pesticides Watch List

Currently registered pesticides that may occur in wastewater

Priority	Basis for Priority Assignment	Pesticides	
1 – High Concern	a) POTW effluent monitoring data[1] exceeding benchmarks b) Known cause of process interference c) Present in recycled water or biosolids at concentrations that limit use d) SF Bay area receiving water 303(d) listing for the pesticide or degradate	Pyrethroids# (21 chemicals[2]) Fipronil# Imidacloprid#	
2 – Moderate Concern	a) Pesticide contains a Clean Water Act Priority Pollutant b) SF Bay area receiving water 303(d) listing for the pesticide, degradate or contaminant that also has non-pesticide sources	Copper pesticides+ Silver pesticides+ [illegible]	
3 – Possible Concern	Monitoring data[1] approaching or wastewater discharge modeling predicting: a) effluent or receiving water benchmark exceedances b) process interference c) limitations on use of recycled water or biosolids or used for pet flea control	[illegible] Ammonium bromide 1,2-Benzisothiazolin-3-one (BIT) Bronopol (Bioban) Cetylpyridinium Chloride Chlorhexidine Chlorinated isocyanurates+ Clothianidin 2,2-Dibromo-3-Nitrilopropionamide (DBNPA) 4,5-dichloro-2-octyl-3(2H)-isothiazolone (DCOIT) Dichlobenil^ Dinotefuran# Diquat dibromide^ Fluralaner (FDA reg.)# Folpet Halohydantoins+ Indoxacarb# IPBC Malathion (lice) Metam sodium^	[illegible] 5- chloro-2-methyl-4-isothiasolin-3-one (CMIT) Methoprene# Moxidectin (FDA reg.)# Nanopesticides (all) 10,10 oxybisphenoxarsine (OBPA) o-Benzyl-p-chlorophenol (OBPC) Octhilinone 2-n-Octyl-4-isothiazoline-3-one (OIT) Organic Esters of Phosphoric Acid (OEPA) o-Phenyl phenol Polyhexamethylenebiguanidine (PHMB)+ Potassium Peroxymonosulfate+5 Pyriproxyfen#+ Quaternary Ammonium Compounds (QACs) +6 Selemectin (FDA reg.)# Spinetoram# Tetrachlorvinphos# (TCVP) Triclosan Tri-n Butyl Tetradecyl Phosphonium Chloride (TTPC)
Pools & hot tubs	Avoiding collection system backups	Busan-77+ Chlorine+ Hypochlorites+	Sodium bromide+ Sodium tetraborate+4 (plus chemicals above with "+")
Pending	New pesticides that could threaten wastewater depending on uses approved and market volumes for existing minor indoor uses	Abamectin Broflanilide Chlorfenapyr Chlorantraniliprole Cyantraniliprole	Cyclaniliprole Neonicotinoids not listed above[3] Novaluron SI–183 (1R-Phenothrin)
No Concern	No tracking trigger	Most of the 1,000 existing pesticides	

Unknown	Lack of information. No systematic screening has ever been completed for urban pesticides.	Unknown

[1]Not necessarily data from SF Bay Area
[2]Pyrethroids = Allethrins, Bifenthrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Cyphenothrin, Deltamethrin, Esfenvalerate, Etofenprox, Flumethrin, Imiprothrin, Metofluthrin, Momfluorothrin, Permethrin, Prallethrin, Resmethrin, Sumethrin [d-Phenothrin], Tau-Fluvalinate, Tefluthrin, Tetramethrin, Tralomethrin
[3]Neonicotinoids = Acetamiprid, Clothianidin, Dinotefuran, Imidacloprid, Nitenpyram, Thiacloprid, Thiamethoxam
[4]EPA Registration Review name: "Boric acid/Sodium Salts"
[5]EPA Registration Review name: Hypochlorous Acid; EPA may determine that it is an adjuvant subject only to CA registration.
[6]QACs used indoors include ADBAC, BAC, ATMAC, DADMAC, DDAC, EBAC, APyrC, and others. Additional QACs are listed on the pool/spa pesticide list below.
+Has pool and/or hot tub use in California
^Has root control use in California
#Has pet flea/tick use

Swimming Pool and Hot Tub Pesticides

- Imidazolidinedione

Hypochlorites: Calcium Hypochlorite, Sodium Hypochlorite, Potassium Hypochlorite, Lithium Hypochlorite
Chlorinated isocyanurates: Sodium Dichloro-S-Triazinetrione, Sodium Dichloro-S-Triazinetrione Dihydrate
Copper:

- Copper Sulfate (Pentahydrate)
- Copper Ethanolamine Complexes Mixed
- Copper Triethanolamine Complex
- Copper Citrate
- Copper

Quats/ADBAC, DDAC, and EBAC family chemicals:

- Alkyl (50%C14, 40%C12, 10%C16) Dimethylbenzyl Ammonium Chloride
- Alkyl (60%C14, 30%C16, 5%C12, 5%C18) Dimethylbenzyl Ammonium
- N-Dialkyl (60%C14, 30%C16, 5%C12, 5%C18) Methyl Benzyl Ammonium Chloride
- Alkyl (68%C12, 32%C14) Dimethylethylbenzyl Ammonium Chloride
- Didecyl Dimethyl Ammonium Chloride
- Alkyl (58%C14, 28%C16, 14%C12) Dimethylbenzyl Ammonium Chloride
- Alkyl (67%C12, 25%C14, 7%C16, 1%C8,C10,C18) Dimethylbenzyl Ammonium Chloride
- Alkyl (95%C14, 3%C12, 2%C16) Dimethyl Benzyl Ammonium Chloride
- Alkyl (50%C14, 40%C12, 10%C16) Dimethylbenzyl Ammonium Saccharinate
- Alkyl (61%C12,23%C14,11%C16,2.5%C8 & C10,2.5%C18) Dimethyl Benzyl Ammonium Chloride
- Alkyl (67%C12, 25%C14, 7%C16, 1%C18) Dimethylbenzyl Ammonium Chloride

Silver:

- Metallic Silver
- Silver Chloride
- Silver Iodide, Colloidal

Others:

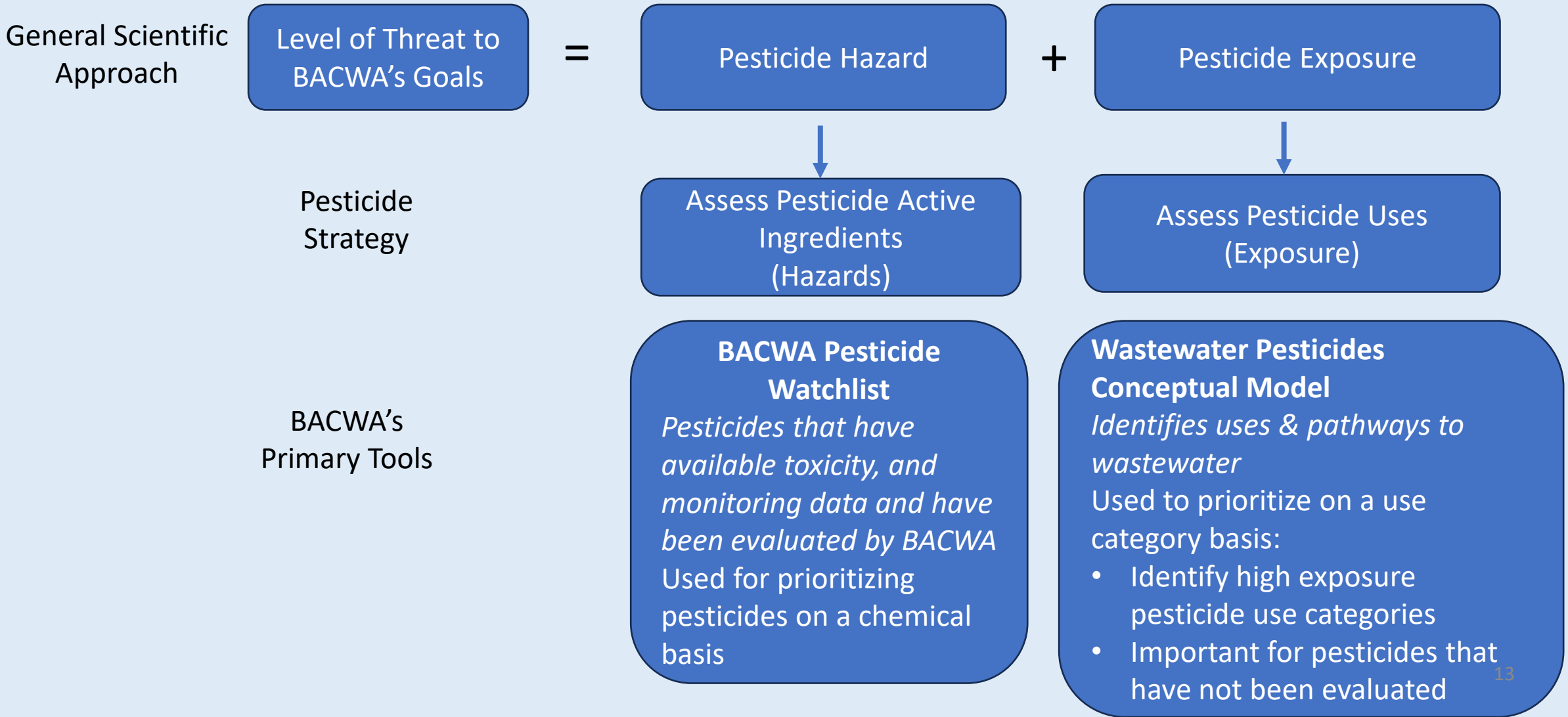
- Busan-77 [a polyquat also known as Polixetonium Chloride or Poly(Oxyethylene) (Dimethylimino) Ethylene (Dimethylimino) Ethylene Dichloride]
- Sodium Bromide (EPA "Inorganic halides")
- Zinc Sulfate Monohydrate
- Polyhexamethylene Biguanidine (PHMB)
- Chlorine
- Sodium Tetraborate (Pentahydrate) (EPA "Boric Acid/Sodium Salts")
- Pyriproxyfen
- 10,10 oxybisphenoxarsine (OBPA): used in coating interiors of pools and hot tubs
- Potassium Peroxymonosulfate and Potassium Peroxymonosulfate Sulfate

We are tracking dozens of pesticides

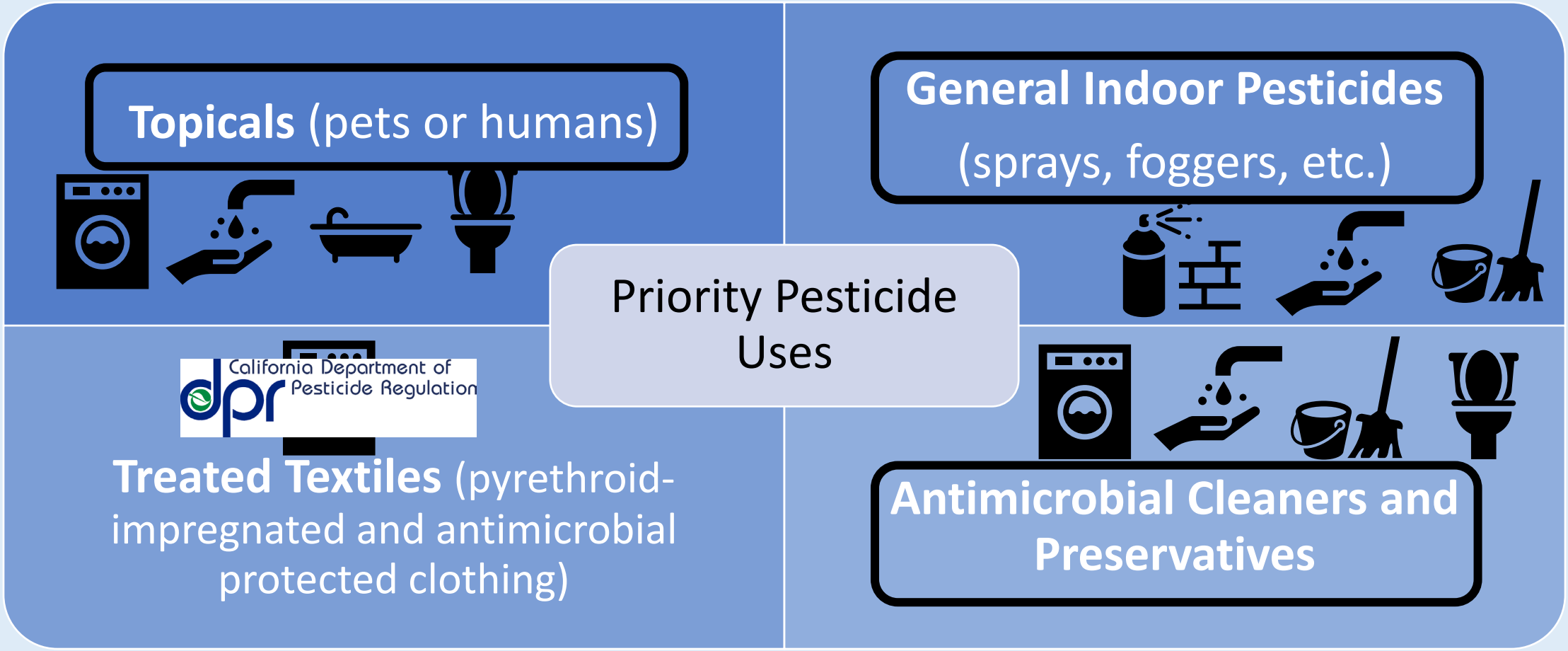
Top Two Tiers of the Watch List

Priority	Basis for Priority Assignment	Pesticides
1 – High Concern	a) POTW effluent monitoring data exceeding benchmarks b) Known cause of process interference c) Present in recycled water or biosolids at concentrations that limit use d) SF Bay area receiving water 303(d) listing for the pesticide or degradate e) Identified by RMP as a High or Very High Concern	Pyrethroids (21 chemicals) Fipronil Imidacloprid
2 – Moderate Concern	a) Pesticide contains a Clean Water Act Priority Pollutant b) SF Bay area receiving water 303(d) listing for the pesticide, degradate or contaminant that also has non-pesticide sources c) Identified by RMP as a Moderate Concern	Carbendazim Copper pesticides Silver pesticides Zinc pesticides QACs

Our science-based Pesticide Prioritization Process



Through this process, we identified four high-exposure pathways needing attention



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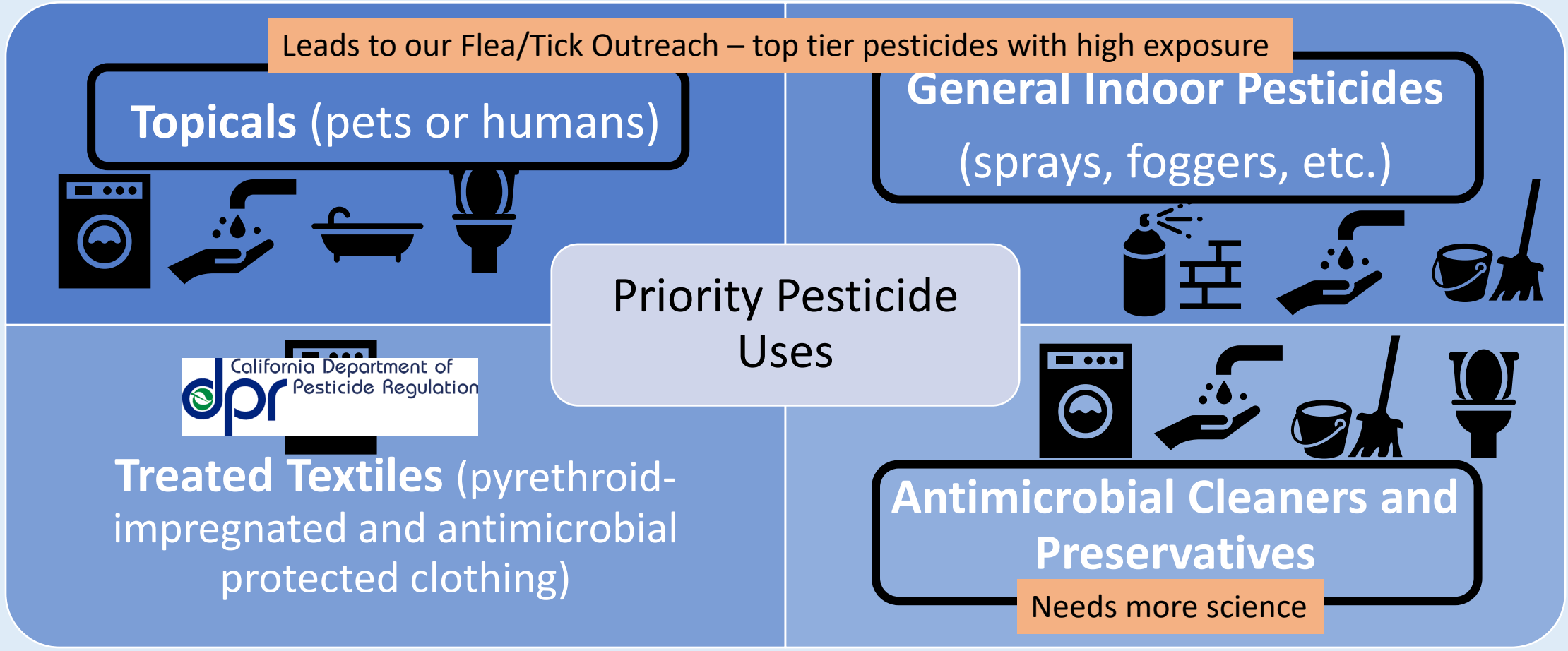

What are your questions?

2024 Flea/Tick Outreach Effort

- Communicated with veterinarians
  - Palo Alto continued shelter outreach
  - Obtained Continuing Education credit (nationally approved) for outreach presentation
  - National speaking engagements
    - Veterinary Information Network, February 2024
    - American Veterinary Medical Association, June 2024
    - University of Florida Shelter Vet training (online), Dec. 2024
    - National veterinary survey
    - 637 US veterinarians, including 73 California vets

- Drafted a multi-year BAPPG workplan

Veterinary Survey Results

- 12% of US vets (and 18% of California vets) currently do not recommend either fipronil or imidacloprid to their clients
- When presented with brief information (mid-survey) about aquatic toxicity concerns, an additional 60% of vets indicated they would be somewhat or very willing to consider changing their product recommendations.

- 2024 VIN Survey

Alternative strategies they would recommend (in order of preference):

Flea Control

1. Orals/chewables
2. Home mechanical treatments (vacuuming, washing bedding)
3. Another on-pet topical or collar
4. Professional pest control service
5. Home pesticidal treatments (carpet sprays or foggers)
6. Flea shampoo

Tick Control

1. Orals/chewables
2. Rigorous coat inspections
3. Another on-pet topical or collar
4. Keeping the dogs on trails / avoiding woods and tall grass
5. Professional pest control service
6. Creating a tick free zone in the yard
7. Home pesticidal treatments (outdoor sprays)

- 2024 VIN Survey

Top Four Barriers Identified by Vets

1. Cost
2. Client compliance / Ease of administration
3. Prescription vs OTC
4. Adverse reactions/Suitability (seizures, food allergies to chewable flavorings, pregnant/lactating patients, puppies and kittens)

- 2024 VIN Survey

Proposed Workplan for 2025-2027

A. Update Colleagues

Educate wastewater colleagues on our outreach efforts to date, our findings from the veterinary community, and proposed next steps

B. Regulatory Communication

- Focus on several branches of DPR and the DTSC Safer Consumer Products Program
- Discuss opportunities and challenges based on findings from the veterinary community
- Seek opportunities to collaborate and/or pilot projects

C. Communicate with Veterinary Leadership

- Engage with the Veterinary Leadership – Bay Area and nationally
- Focus on One Health, sustainability, vet toxicologists and vet parasitologists

D. Continued BAPPG Outreach

- Replicate Palo Alto's municipal shelter outreach
- Reach out to local veterinary tech community colleges
- Media, ad, and online campaigns
- Reach out to Bay Area chains

Step 1A: Update BACWA Members and Wastewater Colleagues

Educate wastewater colleagues about the hazard and exposure pathways of indoor and on-pet parasiticides, our outreach efforts to date, the vet Survey and AVMA findings, and proposed next steps.

NEXT STEPS: Stephanie to lead via existing contract

- ✓NACWA December 4, 2024 Pretreatment Virtual Training – "Pesticides and Pets: A Practical Approach to Protecting POTWs and the Environment"
- ✓BAPPG January 29, 2025 meeting
- ❑**CWEA P3S February 4, 2025 presentation**
- ❑BACWA Exec Committee (February 2025)
- ❑RWQCB Region 2 Wastewater staff
- ❑Suggest a session for future RMP State of the Estuary meeting (SFEI, DPR, Veterinary Update)
- ❑WEFTEC 2028, Anaheim

Step 1B: Communicate with Regulatory Agencies and State Partners

Communicate with regulatory agencies and state partners about the hazard and exposure pathways of indoor and on-pet parasiticides, challenges identified by the vet community, and opportunities to collaborate and/or pilot projects

NEXT STEPS:

Stephanie to lead via existing contract

- DPR
  - Surface Water Protection Program
    - ❑Periodic invitations to the Pesticide Workgroup
  - Worker Health and Safety Branch - led by Nan Singhasemanon
    - ❑Groomer safety issues re. fipronil identified by DPR's Human Health Assessment Branch
    - ❑Janitor safety issues related to foggers in multi-family dwellings
  - Environmental Justice and Equity Office (to discuss EJ of costs vs human health risks)
    - ❑The costs of flea control alternatives vs human health risks of fipronil products
  - Human Health Assessment Branch (to track future mitigation steps)
- Communicate with the UC Extension staff about updating UCANR/UCIPM materials to line up with latest scientific studies and IPM alternatives
  - ❑Seek a meeting with representatives of the Water Board, DPR, POTWs, and UCIPM staff

Step 1C: Communication with Veterinary Leadership – Next Steps

Engage with Veterinary Leadership, particularly focused on opportunities within One Health, sustainability, vet toxicologists and vet parasitologists

NEXT STEPS: Stephanie to lead via existing contract

- ❑ Review our language (website and presentations) to align with the language of the One Health Community – animal health, human health and environmental health
- ❑ Seek opportunities to engage with leaders who have been receptive to our message
- ❑ Reach out to Ross Kelly, Managing Editor at VIN, to seek a second VIN article about DPR's sewershed study and other recent insights
- ❑ Seek opportunities to engage with recently-identified leaders

Step 1D: Continued BAPPG Bay Area Outreach

Replicate Palo Alto's municipal shelter outreach at shelters and regional chains, broaden outreach regionally, and reach out to local veterinary tech community colleges.

NEXT STEPS:

- ❑Encourage agencies to replicate Palo Alto's muni shelter outreach using BACWA-branded outreach
  - Develop printing/distribution plan for the BACWA-branded Flea/Tick Flyers
  - Provide training/assistance as needed
- ❑Approach chains in the Bay Area and PA service area, such as Adobe, VCA, and Pet Food Express
- ❑Consider how to reach social media outlets, like Instagram and Facebook
  - Focus on short format reels
  - Explore partnerships with science-based YouTube influencers
- ❑Develop a media pitch about this topic
- ❑Develop a regional ad campaign (2025-2026)

Funding the Workplan for 2025-2027

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Fundable with current BAPPG outreach contract with Hughes: *Professional Training and Policy/Regulatory Support*

Requires additional resources

Discussion, Feedback and Next Steps

Dall-E created image by Alessandra Moyer, SF Bay Regional Water Board

REGIONAL WATER QUALITY CONTROL PLANT

BACWA BAY AREA CLEAN WATER AGENCIES

Thank You for Your Attention!

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