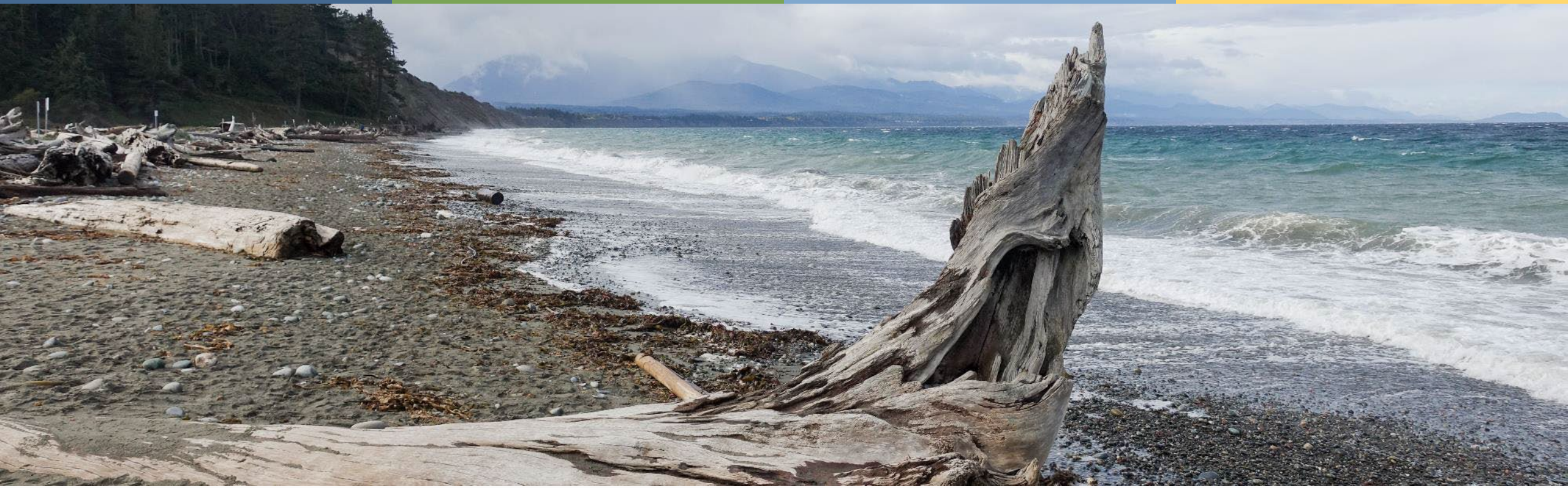


Phthalates Action Plan – starts at 1:00 p.m. PDT

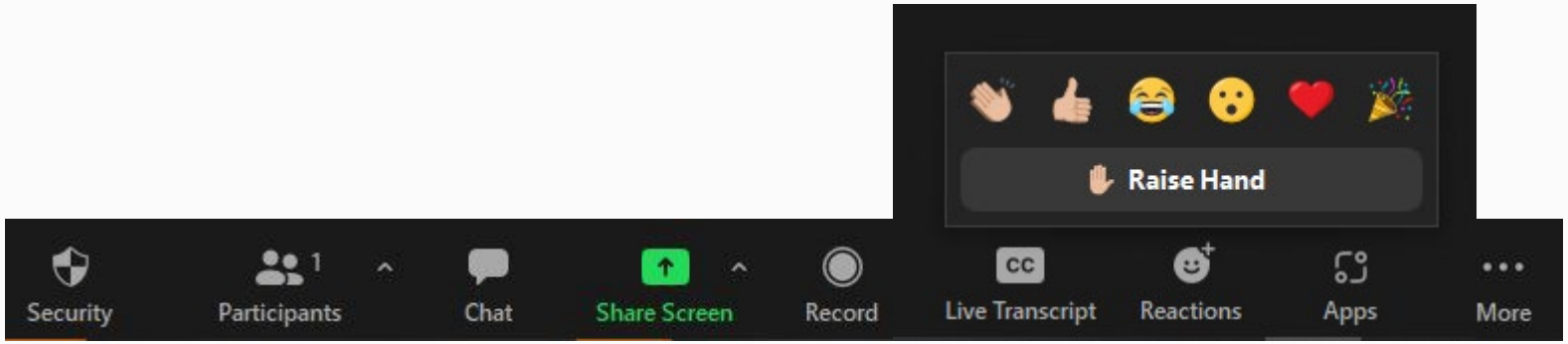
Advisory Committee Meeting
October 25, 2022

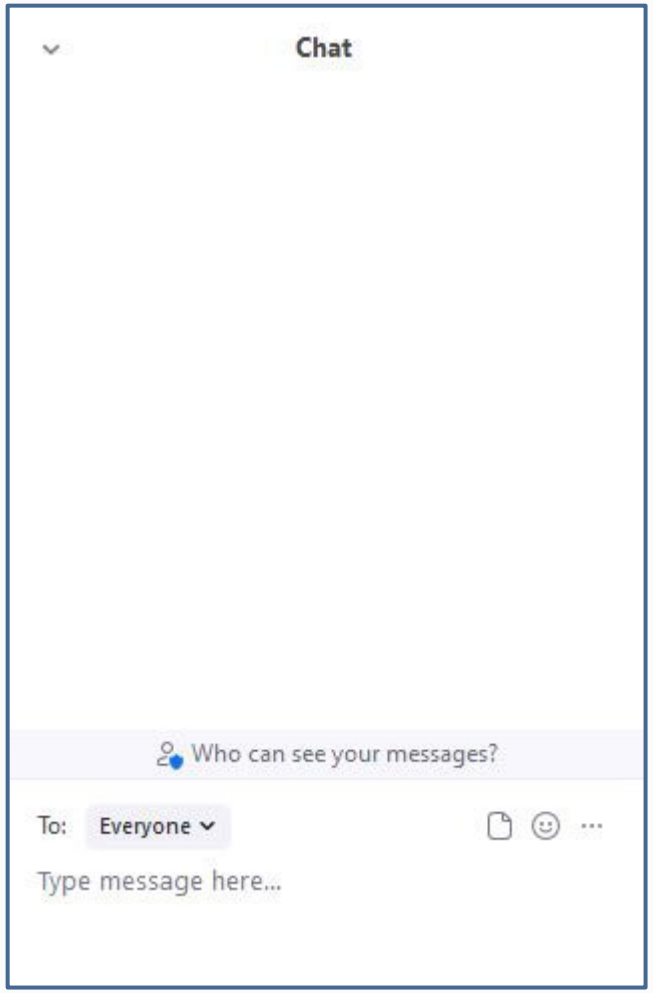
DEPARTMENT OF ECOLOGY
State of Washington

Washington State Department of Health

Zoom meeting logistics

- Technical issues send to **host** in chat
- Questions or comments send to **everyone** in chat
  - We will address along the way and during discussion.
- During discussion, raise hand to share verbal input or questions





Today's agenda

1. Introductions and updates
2. Preliminary draft recommendations — Presentations
3. Content of the draft and final action plans
4. Next steps
5. Public input and questions

Part One: Introductions and updates

Project Team

Department of Ecology

- Hazardous Waste and Toxics Reduction Program
- Solid Waste Management Program
- Environmental Assessment Program
- Air Quality Program

Department of Health

- Office of Environmental Public Health Sciences
- Office of Drinking Water

Washington Department of Fish and Wildlife

- Toxics Biological Observation System

Advisory Committee

Will any new members please introduce yourselves?

We look forward to your comments on the preliminary draft recommendations.

Plan development timeline

2022 Aug. – Sept.

- AC Review
- Finalize scope 8/9/22
  - Management signoff
- Draft recommendations

2022 Oct.

- Review recs. with AC (meetings)
- Draft AP

2022 Nov. – Dec.

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2023 Jan. – Feb.

- Economic analysis
- Editing
- AC review
- Management review of draft (early 2023)

2023 Mar. – Dec.

- Issue Draft AP
- Public comment March/April
- Revisions from comments
- Final management review/signoff
- Final AP

What you'll see today

- A series of presentations that contain **Preliminary Draft Recommendations** for "downstream" environmental and waste media (the *final* draft recommendations will be in the draft AP — published Spring 2023).
- Presentations were developed with cross-program and cross agency coordination.
- These are works in progress, and we want your comments and suggestions.
- We'll take time for discussion at the points indicated in your agenda.
- Subject matter experts are here to answer questions.

Preliminary Draft Recommendations for "upstream" sources, such as consumer products, will be presented on November 3, 2022.

Part Two: Preliminary draft recommendations — Presentations

Waters, Sediment, and Biota

Environmental and Human Health

Prepared by

Emerson Christie, Office of Environmental Public Health Sciences, Washington Department of Health
Callie Mathieu, Environmental Assessment Program, Washington Department of Ecology
Molly Shuman-Goodier, Toxics Biological Observation System, Washington Department of Fish and Wildlife

Problem Statement

- Understand the scope of phthalate contamination in environmental media (waters, sediment, and biota).
- Evaluate what this scope means for biota and human toxicity.

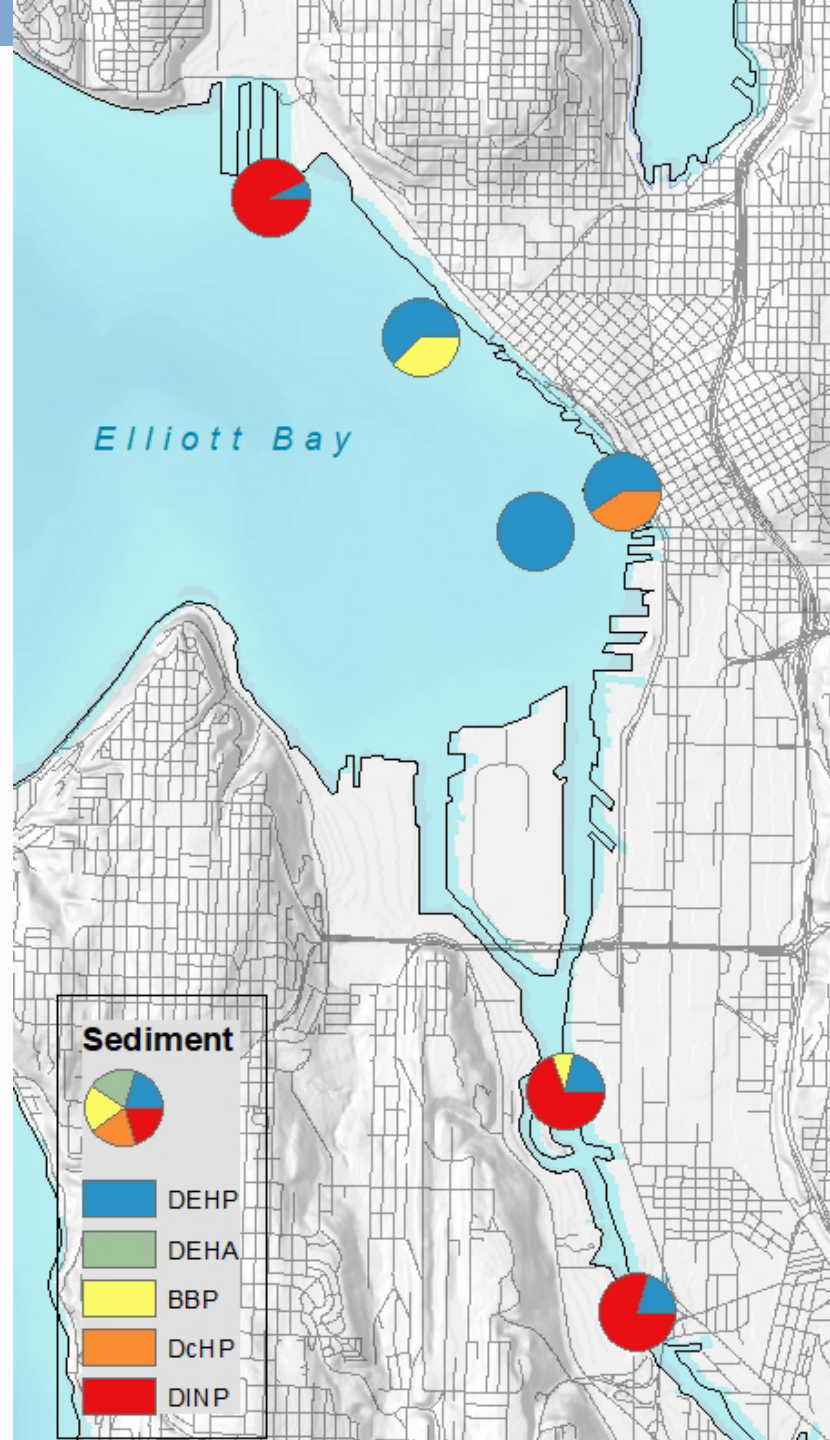
Recommendation Background Water and Sediments

- Ecology monitors 6 phthalates in Puget Sound sediments (25 years).
  - DEHP is common in urban bay sediment (Partridge et al., 2018). BBP, DBP, DnOP, and DMP occur as well.
- Ecology studies also show DEHP is prevalent in urban stormwater and stormwater sediments (Hobbs et al., 2015).
- Phthalates are less frequently detected in ambient surface water.
- No ongoing monitoring for phthalates in ambient surface water or freshwater sediment.

Recommendation Background Water and Sediments

A 2021 survey (Mathieu and Bednarek, 2022) of 16 phthalates in ambient surface water and sediments showed:

- Few detections of newly tested phthalates.
- DINP was tentatively identified at higher concentrations than DEHP in some sediments.
- Most were not detected at levels that may be ecologically relevant (based on lowest PNECs predicted by NORMAN database), however, we need better thresholds to compare to.



Recommendation Background Phthalates in Aquatic Biota

- Monitoring for phthalates in marine organisms has not been conducted by WDFW since 1995.
- Historical monitoring efforts were not reliable due to contamination from equipment containing plastics.
- Recent studies have detected phthalates and their primary metabolites in baleen whales, harbor porpoises, sea turtles, fish, prawns, and molluscs (Hu et al., 2016; Rian et al., 2020; Routti et al., 2021; Savoca et al., 2018; Savoca et al., 2021; Zhang et al., 2021).

Recommendation Background Toxicity to Aquatic Biota

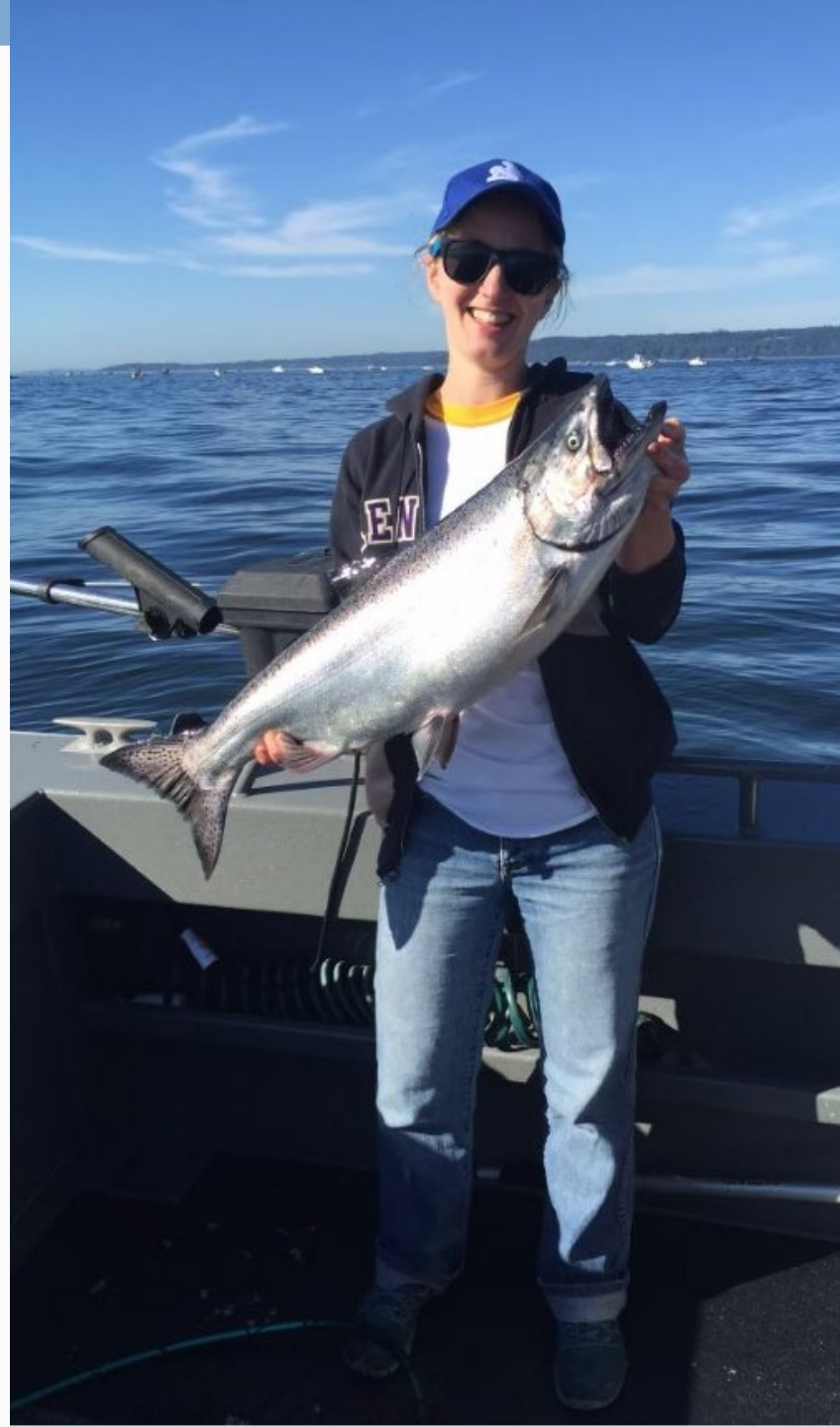
- Development and reproductive effects have been observed in fish, and effects can be additive (Forner-Piquer et al., 2019; Kaplan et al., 2013; Ye et al., 2014; Zhang et al., 2021).
- Canadian PNECs for 14 phthalates ranged from 0.07 ug/L (DEHP) to 190 ug/L (DIBP).

Available aquatic toxicity data:

- 307 studies available in EPA's ECOTOX knowledgebase.
- 267 studies available in HAWC being evaluated in ongoing risk evaluations by US EPA under the amended Toxic Substances Control Act (TSCA).

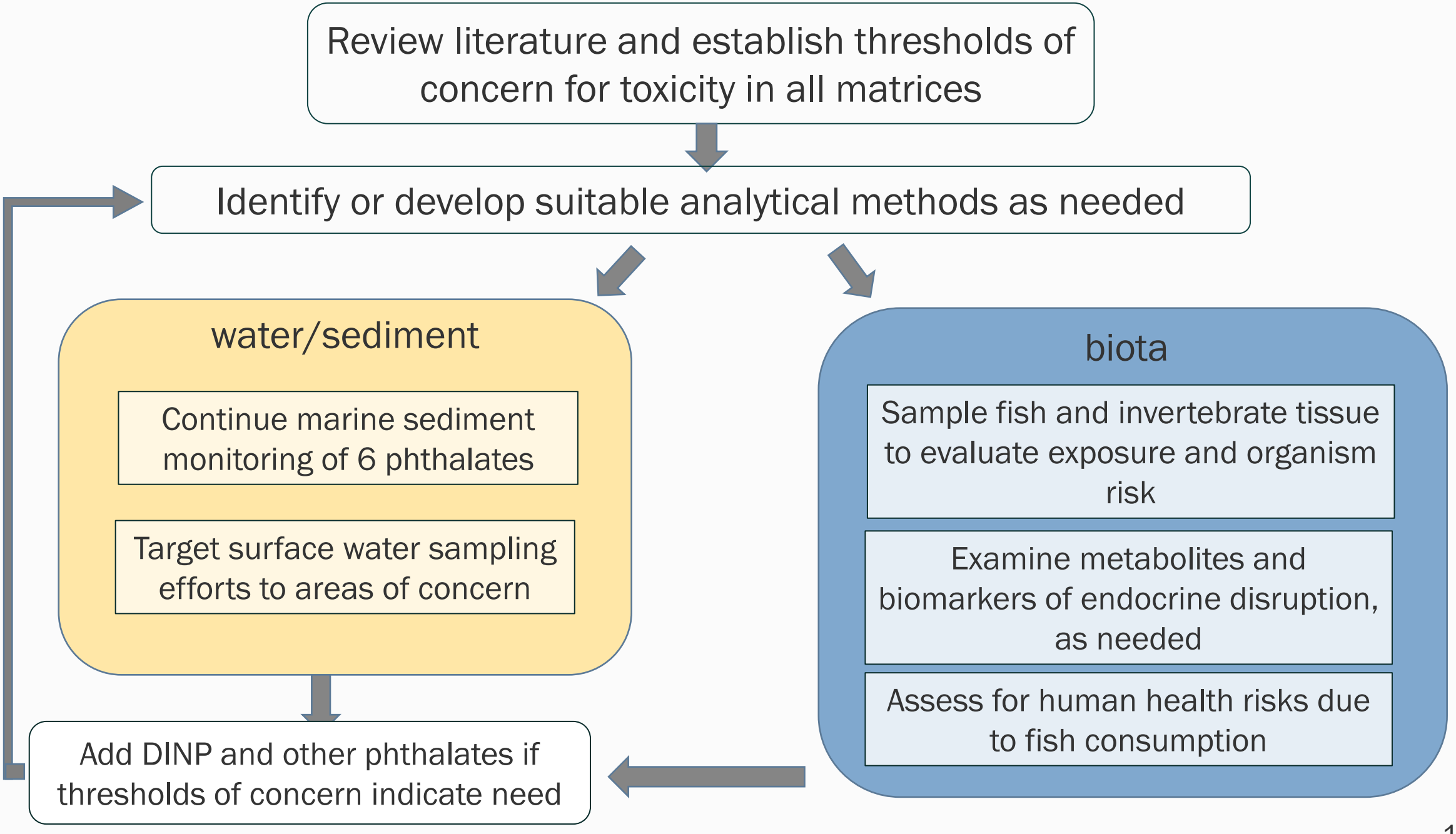
Recommendation Background
Human Exposure via Fish Consumption

- Diet is a significant exposure pathway for phthalates (Serrano et al. 2014).
- Phthalates have been identified in fish tissue (Zhang et al. 2021).
- Risk assessments in China indicate fish consumption is lower risk (Cheng et al. 2013; Zhang et al. 2021).
- Fish consumption is an exposure route (Serrano et al. 2014).



Barriers to Action

- Methods need to be adopted or developed that can detect concentrations in environmental matrices.
- Neither Washington Department of Fish and Wildlife or Ecology have existing funding to routinely screen for phthalates in biota/fish tissue.
- Department of Health cannot provide public health guidance without fish tissue data to evaluate.


Review literature and establish thresholds of concern for toxicity in all matrices
Identify or develop suitable analytical methods as needed
water/sediment
Continue marine sediment monitoring of 6 phthalates
Target surface water sampling efforts to areas of concern
biota
Sample fish and invertebrate tissue to evaluate exposure and organism risk
Examine metabolites and biomarkers of endocrine disruption, as needed
Assess for human health risks due to fish consumption
Add DINP and other phthalates if thresholds of concern indicate need

Preliminary Draft Recommendations, in addition to ongoing current monitoring

1. Review literature and determine, where possible, thresholds of concern for toxicity in all matrices.
2. Identify or develop suitable analytical methods as needed.
3. Evaluate the extent and magnitude of phthalate/metabolite exposure in aquatic species.
4. Expand tissue monitoring to include biomarkers of endocrine disruption as needed.
5. Evaluate fish tissue data for human health risk.

Air

Prepared by

Gary Palcisko, Air Quality Program, Washington Department of Ecology

Phthalates – Outdoor Air

Sources

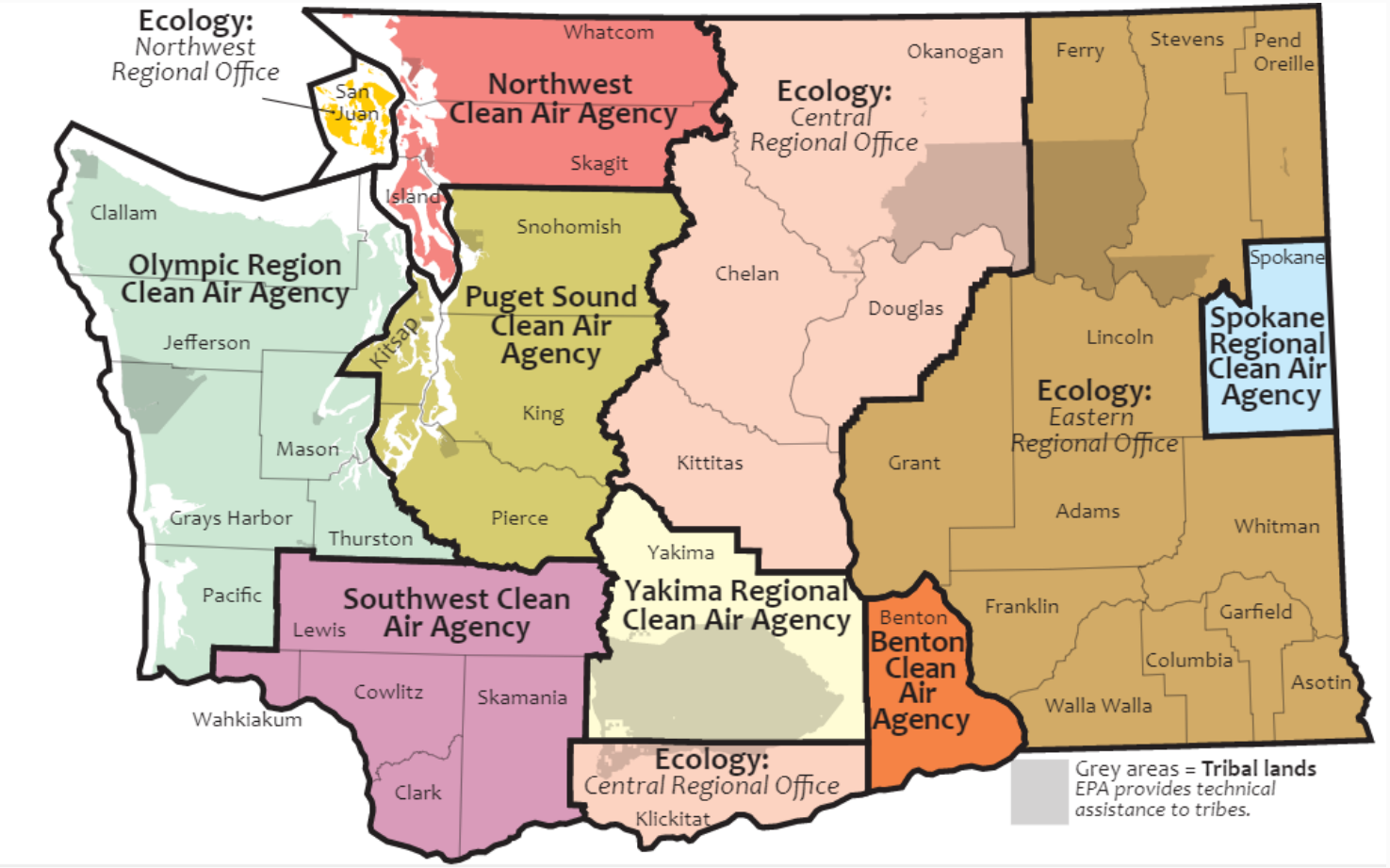
- Consumer products and building materials.
  - Indoor to outdoor.
  - Outdoor materials.
- **Commercial and Industrial facilities?**

Concentrations

- No monitoring in Washington.
- Indoor air generally much greater than outdoor air.

Source: https://www.achillesusa.com/

Preliminary Draft Recommendation Overview



1. Reach out to our local air agency partners to verify and improve accuracy of emissions reporting.
   - Pending the outcome of these efforts, additional coordination with clean air agencies and facilities may be necessary to determine possible solutions.
2. Evaluate the feasibility and cost of using existing air toxics monitoring infrastructure to collect and analyze air samples for phthalates.

Discussion

Comments on the preliminary draft recommendations for water, sediments, biota, and air

Biosolids

Prepared by

Emily Kijowski, Solid Waste Management Program, Washington Department of Ecology

Mallory Little, Office of Environmental Public Health Sciences, Washington Department of Health

Biosolids Background

- Biosolids are a semisolid product rich in organic matter that preserves nutrients from the wastewater treatment process.
- Biosolids are applied to land to improve soil health, enhance vegetation growth, and sequester carbon.
- Biosolids are treated to remove pathogens, reduce odor, and are screened for metal pollutants prior to land application.
- However, biosolids may contain contaminants resulting from pre-WWTP sources.

Problem Statement

- Phthalates are commonly used in a wide variety of products including everyday consumer products, building materials, medical plastics, food-grade plastics, etc.
- These sources eventually result in contamination of our wastewaters, sewage sludge, and biosolids.
- Depending on their structure and affinity for water, phthalates may partition to biosolids in wastewater treatment plants (WWTPs).
- 10 – 15% biosolids in Washington state are used as feedstock for compost.

Preliminary Draft Recommendation Overview

- Depending on their structure, phthalate esters either partition to organic materials or water (Dargnat et al., 2006; Gustafsson et al., 2020).
- Depending on their structure, phthalate esters may transfer and degrade from biosolids to soil (Yager et al., 2014).
- Phthalates can be absorbed into plant tissues, with uptake differing between plant species (Sun et al., 2015; Sablayrolles et al., 2013).

We've designed our recommendations with the goals of gathering Washington state-specific data and understanding how phthalates move from sources to biosolids and the environment.

Preliminary Draft Recommendation # 1

To better understand the pathways phthalates take after they are added to WWTP systems, and subsequently as wastewater solids are used to produce biosolids, Ecology should evaluate the transport and breakdown of upstream-sourced phthalates in Washington state WWTP influent, effluent, sludge, and biosolids.

Preliminary Draft Recommendation # 2

Ecology should evaluate the transfer potential of phthalates from biosolids to soil and groundwater.

Preliminary Draft Recommendation # 3

Ecology should evaluate plant uptake of phthalates in crops grown in or on biosolids-amended soils and fields in Washington state.

Preliminary Draft Recommendation # 4

Ecology should evaluate the fate of phthalates in composted biosolids in Washington state.

Recycling Products and Packaging

Prepared by

Alli Kingfisher, Solid Waste Management Program, Washington Department of Ecology

Background: Recycling products and packaging

Phthalates enter the recycling system in two ways:

- Household waste plastics collected for recycling.
  - Original plastic container.
  - Addition of labels, inks, adhesives, and caps and closures.
- Phthalates present in recycled plastic will be present in the remanufactured product or packaging.

Preliminary Draft Recommendation # 1: Identify packaging that contains phthalates

- Conduct a study to identify what plastic packaging used in Washington contains phthalates.
- A separate study could investigate the presence of phthalates in plastic durable goods that are recycled and used to remanufacture other products or packaging.

Preliminary Draft Recommendation # 2: Assess Material Recovery Facility bales for phthalate containing plastic

Following the study in recommendation # 1, assess plastic bales at material recovery facilities to gauge the amount of phthalate-containing plastic being sold to recyclers for processing.

Questions:

- Where do the bales go?
- How much is remade into packaging products?

Compost

Prepared by

Dawn Marie Maurer, Solid Waste Management Program, Washington Department of Ecology

Compost Background

Compost is the product of biological degradation and transformation of organic waste under controlled aerobic conditions.

The resulting product is a stable, recycled material that can be applied to improve soil porosity and fertility, sequester carbon and increase moisture-holding capacity, or used as a mulch to reduce weed growth and insulate soils against extremes of heat and cold.

Compost is used in agriculture, but most municipal compost goes to commercial and residential landscaping as mulch; topdressing on lawns, parks, ballfields, and golf courses; soil stabilization during construction and road building; restoration projects around streams and wetlands; and hydroseeding after earth disturbance.

Compost Background

The commercial and residential landscaping uses create exposure pathways to children and adults through recreation and food systems, as well as terrestrial and aquatic environments.

The materials used to produce compost are called **feedstocks**. Common feedstocks include yard debris, wood waste, food waste, crop residues, manures, and even biosolids.

The preliminary draft recommendations for compost will focus on **municipal yard and food waste operations.**

Compost Background continued

Some compost facilities that accept food waste also take compostable containers and serviceware.

While these compostable plastics, paper, and other materials make it easy for consumers to get food waste into the compost stream, they do not in and of themselves provide a value as a feedstock.

Compost made with “compostables” are not eligible for organic certification and cannot be applied on organic agriculture.

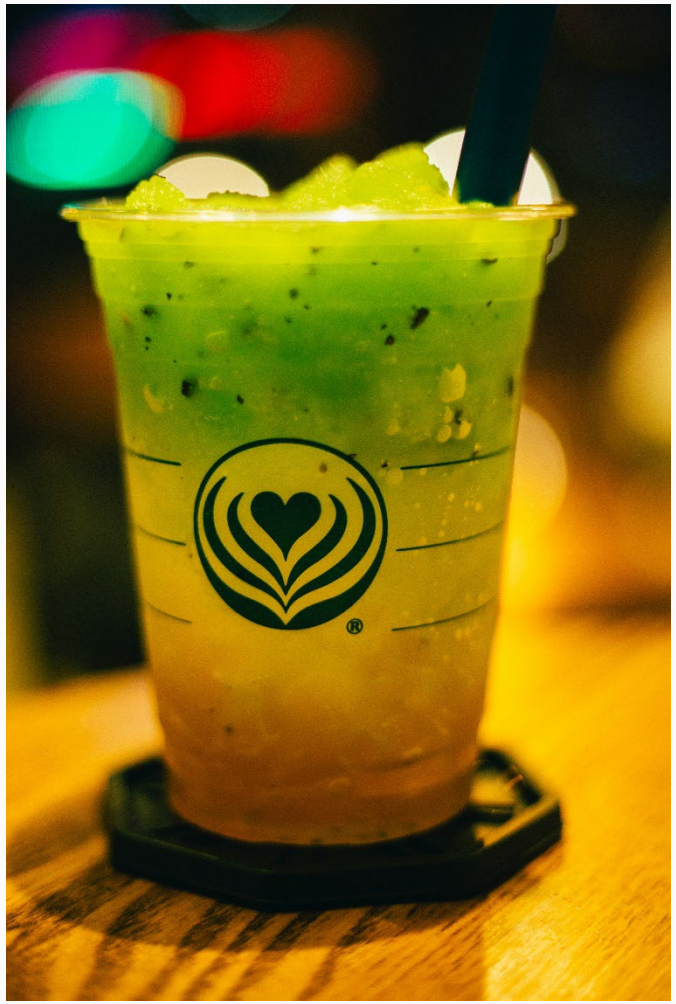
Compost Background continued

During the 2022 legislative session, HB 1799 passed, mandating diversion of organic waste from landfills.

Most local governments will need to address collection and processing of organic materials, including food waste.

We expect a large increase in composting operations, and many governments have already or are considering local ordinances requiring take out food and beverage containers to be compostable.

Problem Statement



- Very little data is available about phthalates in compost.
- There is a growing use of “compostable” containers and other serviceware.
- HB 1799 may increase the prevalence of such materials entering compost feedstocks.
- Consumer confusion over look-alike containers leads to non-compostable materials like plastics ending up in feedstocks when compostable containers are accepted.
- We do not know what risk compostable and non-compostable packaging in compost presents to phthalate proliferation and exposure.

Compost Preliminary Draft Recommendations Overview

Investigate the risk of phthalate contamination in municipal compost and collect more data.

- Develop and implement a plan to test compostable containers and serviceware for phthalates.
- If phthalates are found in compostable products, expand the investigation to testing finished compost from a variety of producers.

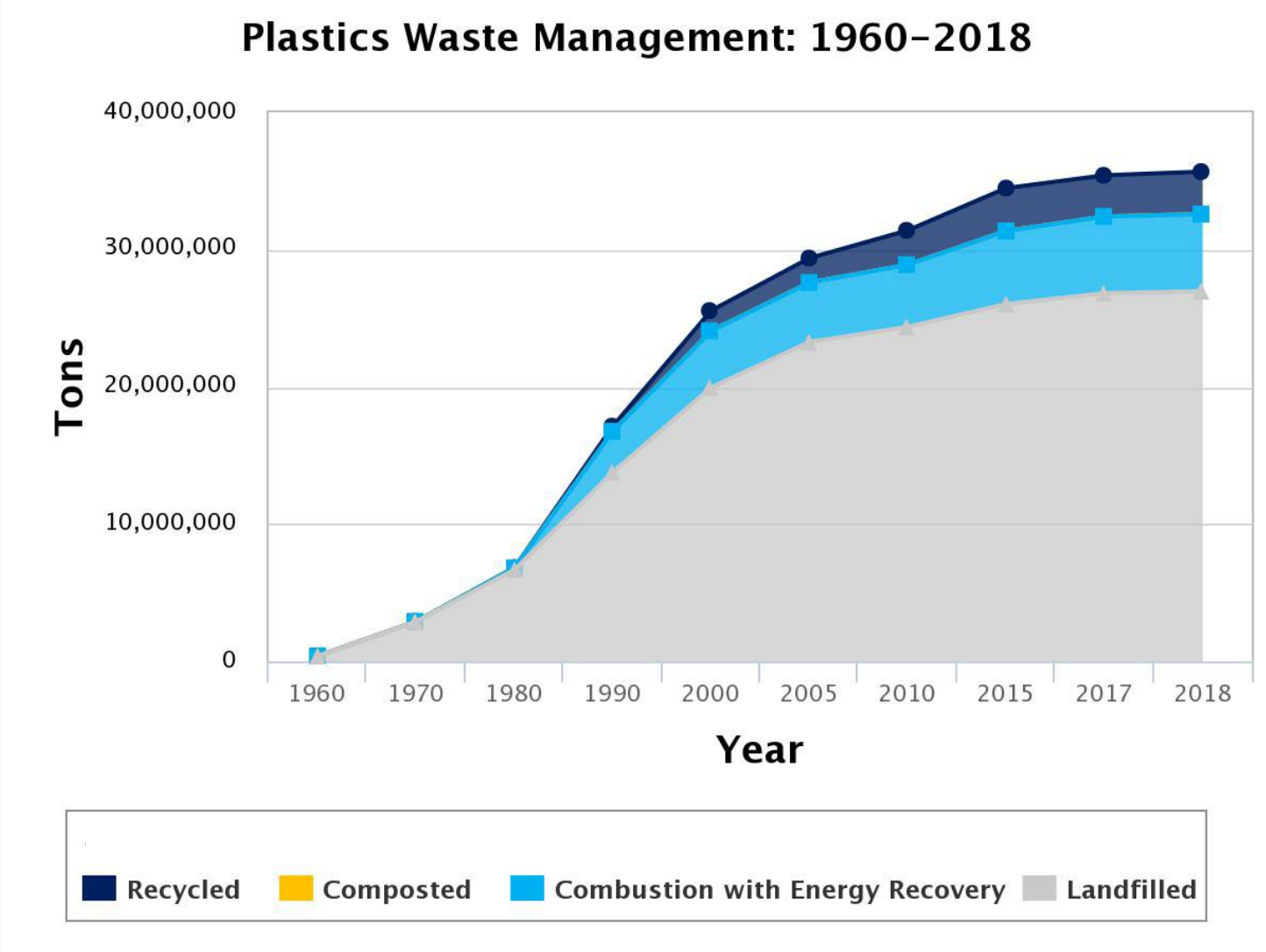
Landfills

Prepared by

Luke LeMond, Solid Waste Management Program, Washington Department of Ecology

Landfill Background

- Landfilling is the predominant disposal method for solid waste.
- 27 million tons of plastic landfilled in the US (18% of all Municipal Solid Waste is plastic).
- Phthalates are ubiquitous in plastic and landfills are a potential long-term source of phthalate release to the environment.



Source: US EPA - 2022

Problem Statement

- Landfill leachate is formed by precipitation and moisture percolating through waste.
- Phthalates have been detected at high concentrations in landfill leachate in other countries.
- Leachate is often treated in municipal wastewater treatment plants prior to discharge.
- Landfill gas is produced during the decomposition of waste. Landfill gas is primarily composed on methane, nitrogen, and hydrogen sulfide, but volatile and semi-volatile organic compounds are also released in landfill emissions.
- Phthalate occurrence in landfill leachate and emissions in Washington is poorly understood.

Preliminary Draft Recommendation # 1: Investigate phthalates in landfill leachate

Conduct a study to identify and characterize phthalate occurrence in landfill leachate in Washington.

This study is a first step to understand potential risk to the environment from leaking landfill liner systems as well as inputs to wastewater treatment plants.

Preliminary Draft Recommendation # 2: Investigate phthalates in landfill gas

Conduct a study to identify and characterize phthalate occurrence in landfill gas in Washington.

This study would focus on sampling gas in existing landfill gas collection systems prior to treatment. This is a first step to understand potential risk to the environment from landfill gas emissions.

Discussion

Comments on the preliminary draft recommendations for biosolids, recycling and packaging, compost, and landfills

Part Three: Content of the draft (spring 2023) and final (late 2023) action plans

Content

- Streamlined, clear, and concise recommendations and rationales
- Clear description of equity and environmental justice considerations
- Cost analyses where relevant
- Lengthy chapters on fate and transport mechanisms, rates of disease, chemistry, etc., will **not** be included.
- Necessary information will be included with each recommendation

Structure of the draft and final recommendations

- Rationale behind recommendation (including issue to be addressed and benefits to Washington)
- Action recommendation, with suggested activities
- Steps for implementation (plus additional information needed prior to implementation)
- Proposed lead agency and partnerships
- Anticipated resource needs
- Additional information (economic analyses as appropriate)

Part Four: Next steps

Plan development timeline

2022 Aug. – Sept.

- AC Review
- Finalize scope 8/9/22
  - Management signoff
- Draft recs.

2022 Oct.

- Review recs. with AC (meetings)
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2023 Mar. – Dec.

- Issue Draft AP
- Public comment March/April
- Revisions from comments
- Final management review/signoff
- Final AP

Please send any comments/recommendations to our online comment site by November 9, 2022.

Part Five: Public input and questions

Project links and information

- Project webpage: https://bit.ly/phthalates-AP
- Contact our team: ChemActionPlans@ecy.wa.gov
- Online comment form: https://hwtr.ecology.commentinput.com/?id=haD3V
- Washington Administrative Code 137-333-340: https://app.leg.wa.gov/WAC/default.aspx?cite=173-333-340

Questions?

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