American Chemistry Council

February 13, 2024

Survey of regulatory approaches for identifying critical gaps for data generation

Why are we here?

$$Goal = \frac{Maximize\ Information}{Minimize\ Resources}$$

(Resources include money, time, expertise, animal use, lab capability,…)

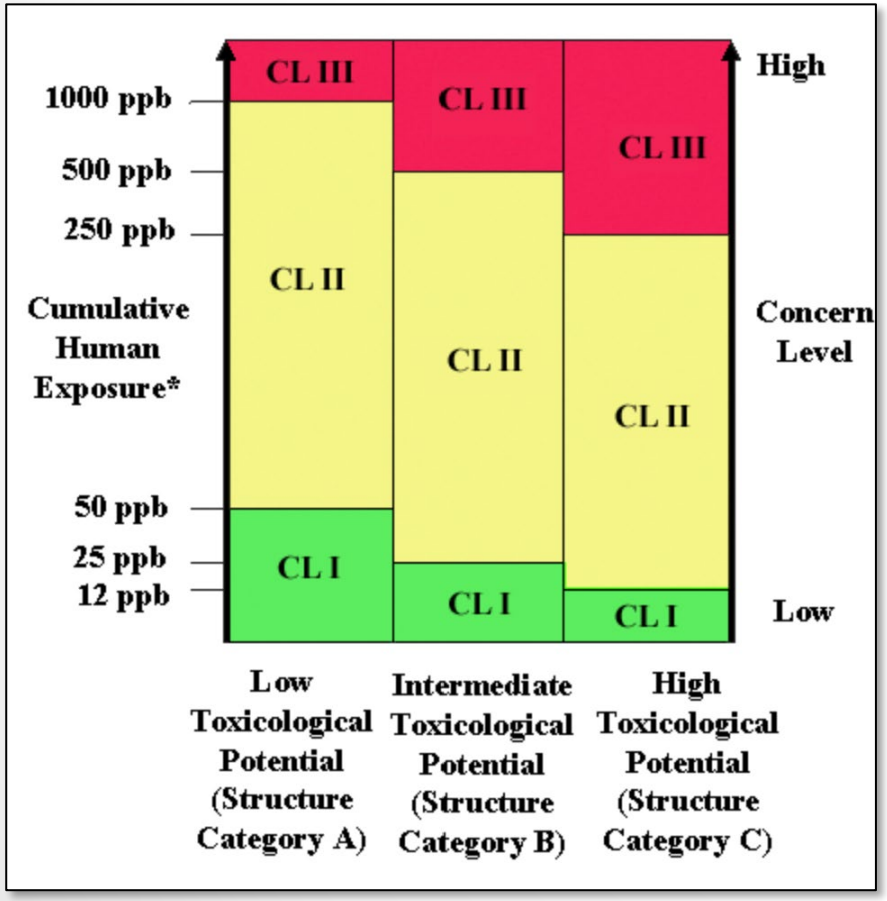
How might we maximize information?

Identify critical gaps for data generation → how might we do that?

- Focus on "what's important"
  - IMHO, with respect to TSCA, what's important is…
    - What's in commerce?
    - What's in commerce in high(er) volumes?
    - What's in commerce that might result in exposure to more vulnerable populations?
- How have others looked at "what's important"?

FDA 1993

FDA Recommended Toxicological Testing for Food Additives Based on Exposure and Toxicological Concern*



Toxicity Tests[3]	Concern Level Low (I)	Level Intermediate (II)	Concern Level High (III)
Genetic Toxicity Tests	X	X	X
Short-term toxicity tests with rodents	X[c]	X[a,c]	X[a,c]
Subchronic toxicity studies with rodents		X[c]	X[a,c]
Subchronic toxicity studies with non-rodents		X[c]	X[a,c]
One-year toxicity studies with non-rodents			X[c]
Chronic toxicity or Combined chronic toxicity/carcinogenicity studies with rodents			X[c]
Carcinogenicity studies with rodents			X
Reproduction studies		X[c]	X[c]
Developmental toxicity studies		X[b,c]	X[b,c]
Metabolism and Pharmacokinetic studies (available in PDF (90 KB) from 1993 Draft Redbook II)		X[b]	X[b]
Human studies (available in PDF (86 KB) from 1993 Draft Redbook II)			X[b]

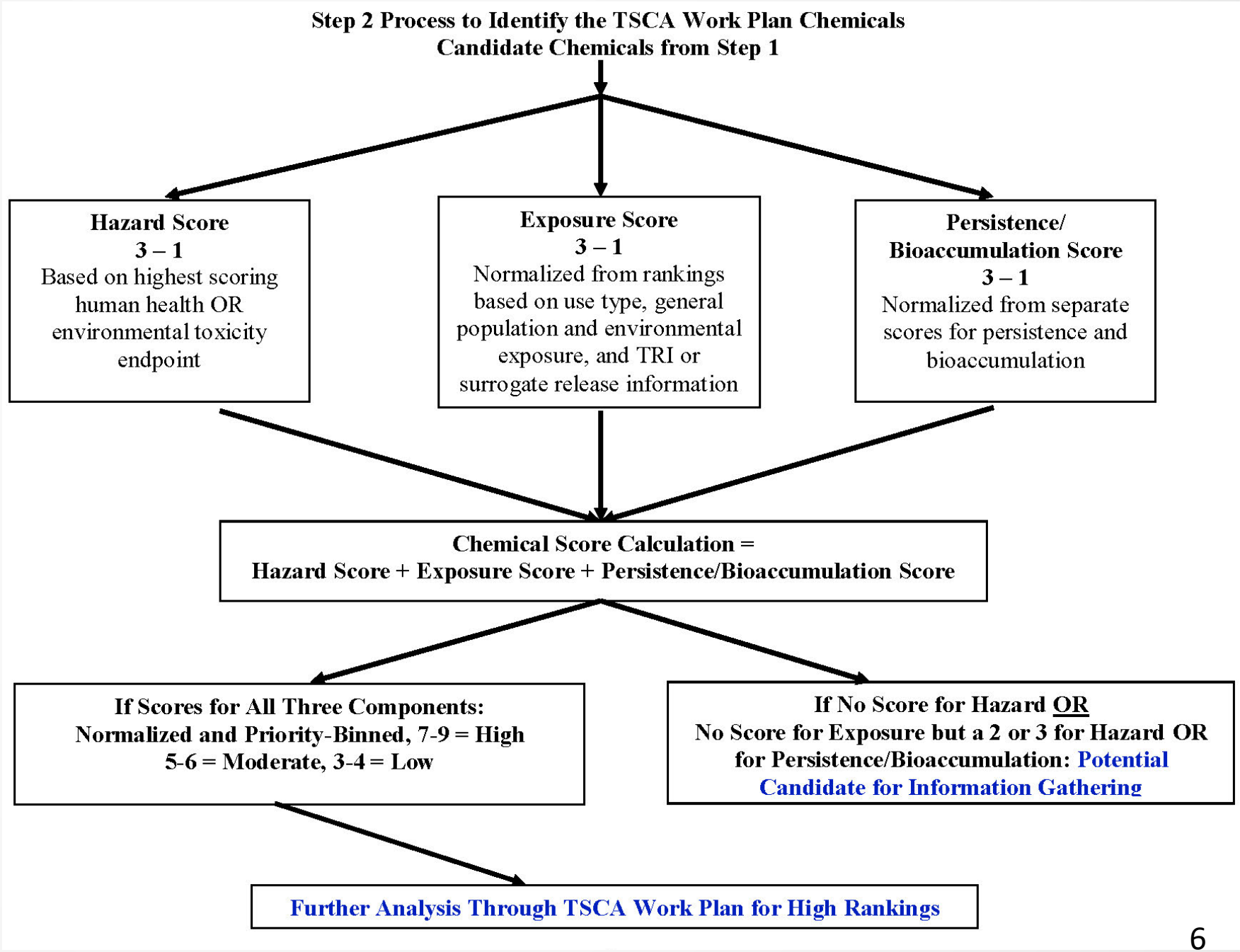
*FDA Guidance for Industry: Summary Table of Recommended Toxicological Testing for Additives Used in Food, https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-summary-table-recommended-toxicological-testing-additives-used-food

Arnot and Mackay 2008

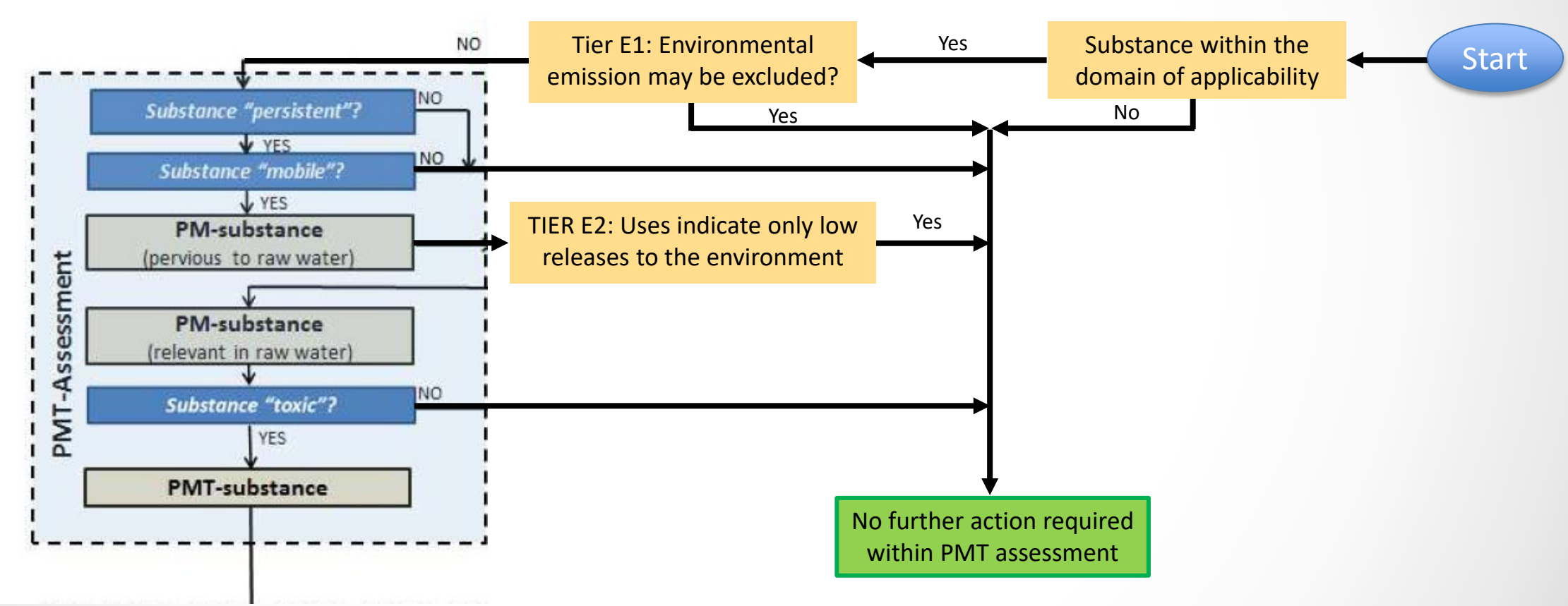
- Proposed a model to integrate persistence (P), bioaccumulation (B), toxicity (T), and quantity information (Q) for a specific substance to assess chemical exposure, hazard, and risk.
- P, B, T, and Q are combined in a risk assessment factor (RAF) providing single values for transparent comparisons of exposure, hazard, and risk for priority setting.
- "risk is an extensive property that requires information on the quantity of chemical released and the resulting exposure"

Arnot, J.A. and D. Mackay. 2008. Policies for Chemical Hazard and Risk Priority Setting: Can Persistence, Bioaccumulation, Toxicity, and Quantity Information Be Combined? *Environmental Science & Technology* 42(13), 4648-4654, DOI: 10.1021/es800106g

EPA TSCA Work Plan 2012

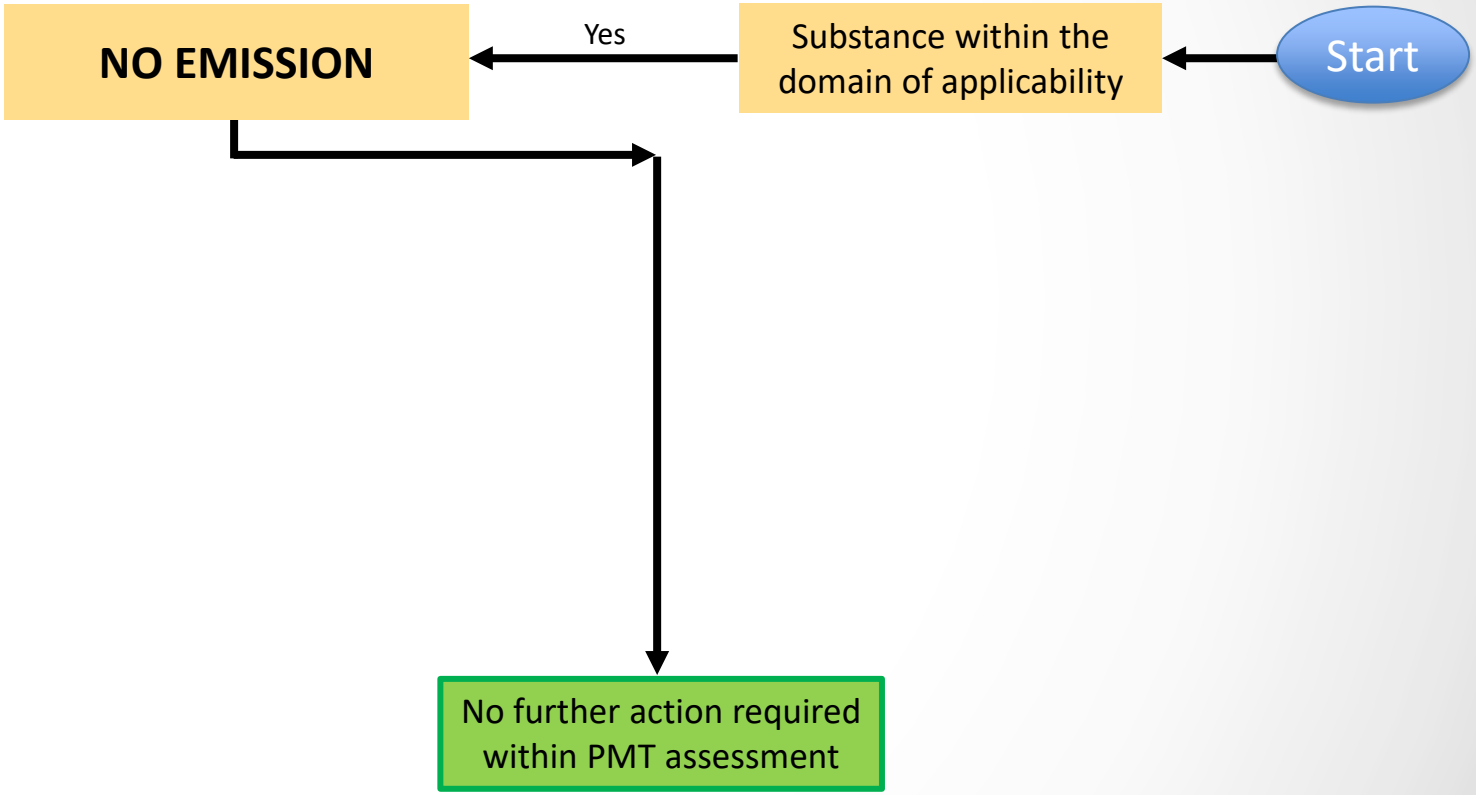


Kalberlah et al. 2014 (FoBiG Report to the German Federal Environmental Agency)



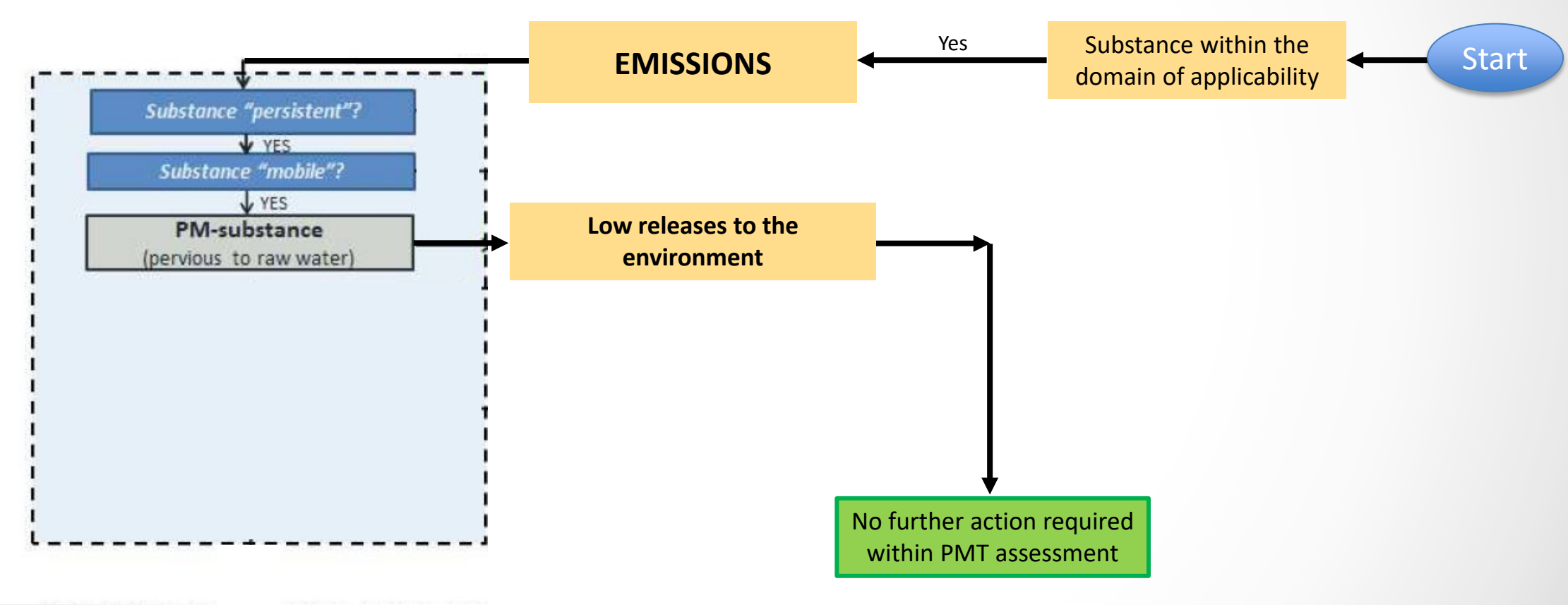
Proposed decision process to identify Persistent, Mobile and Toxic (PMT) substances

Kalberlah et al. 2014
Tier E1: No Emissions



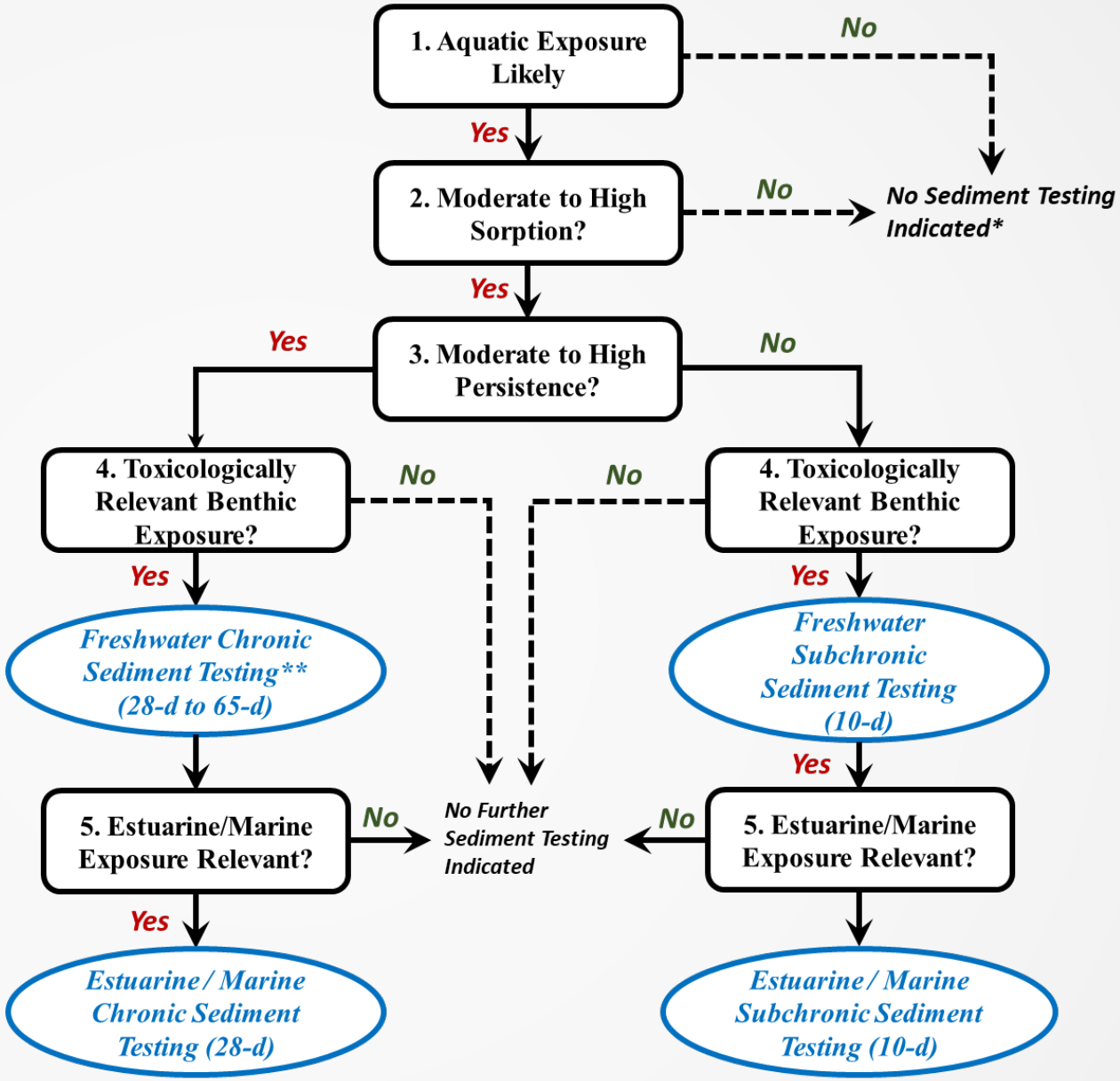
Proposed decision process to identify Persistent, Mobile and Toxic (PMT) substances

Kalberlah et al. 2014
Tier E2: Low Releases to the Environment



Proposed decision process to identify Persistent, Mobile and Toxic (PMT) substances

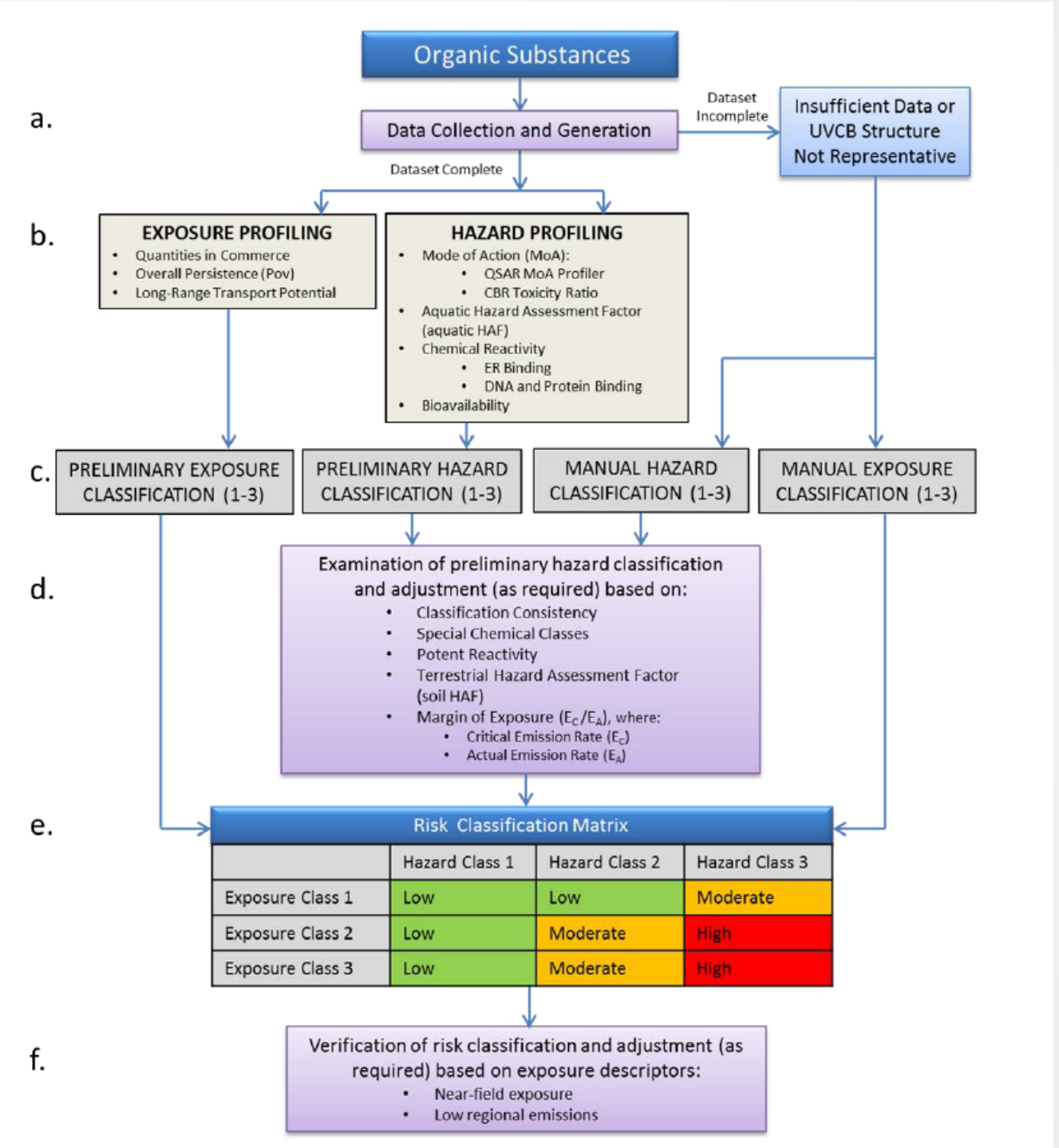
EPA 2014 – When to require whole sediment toxicity tests



* Sediment testing may be required when evidence suggests available water column invertebrate test species are not adequate surrogates for risk assessment purposes (see Section 2.2).

** Chronic (life cycle) tests may be required as part of a tiered approach based on results of subchronic 10-d tests (see Section 3.2.1).

Environment Canada 2016 – Ecological Risk Classification v. 1.0



TSCA PFAS In Commerce

1. Q. Can we identify important (TSCA) PFAS in commerce?
   A. Use the TSCA Section 8(a)(7) Reporting PFAS

2. Q. How many PFAS are in commerce?

   A1. EPA has identified at least 1,462 PFAS covered by TSCA that may be covered by this rule as of February 2023, 770 of which are in commerce.*

   A2. The Public List of TSCA PFAS for 8(a)(7) has 1,224 substances

3. Q. Can we screen out the low exposure potential PFAS?
   A. The LVEs and polymers could be screened out.

*TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances. https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping.

TSCA PFAS In Commerce: Production Volume

TSCA Section 8(a)(7) PFAS Chemicals	1,224
Without CBI Claim	613
That are not a polymer or LVE	477
Reported in 2020 CDR	106
• 2019 PV of >100,000,000 lb.	2
• 2019 PV of 20,000,000 – <100,000,000 lb.	4
• 2019 PV of 1,000,000 – <20,000,000 lb.	21
• 2019 PV of >100,000 but <1,000,000 lb.	70
• 2019 PV of <100,000	9
With CBI Claim	611
That are not a polymer or LVE	94
Reported in 2020 CDR	28
• 2019 PV of >1,000,000 lb.	0
• 2019 PV of >500,000 but <1,000,000 lb.	26
• 2019 PV of <100,000	2

TSCA PFAS In Commerce: Use Pattern

TSCA Section 8(a)(7) PFAS Chemicals	1,224	
Without CBI Claim	613	
That are not a polymer or LVE	477	
Reported in 2020 CDR	106	
• Used in children's products (blowing agents)		2
• Used in consumer products (inc. children)		14
• Used in commercial products only		7
With CBI Claim	611	
That are not a polymer or LVE	94	
Reported in 2020 CDR	28	
• Used in children's products		0
• Used in consumer products		3
• Used in commercial products		3

Summary

- There are many opportunities to assure test data are maximized.
- Various regulators have applied different but credible approaches to identify data gaps for attention.
- There are data available to understand “what’s important” regarding PFAS data gaps.

$$Goal = \frac{Maximize\ Information}{Minimize\ Resources}$$

- To get the “most bang for the buck” data generation needs to be optimized against resource constraints.