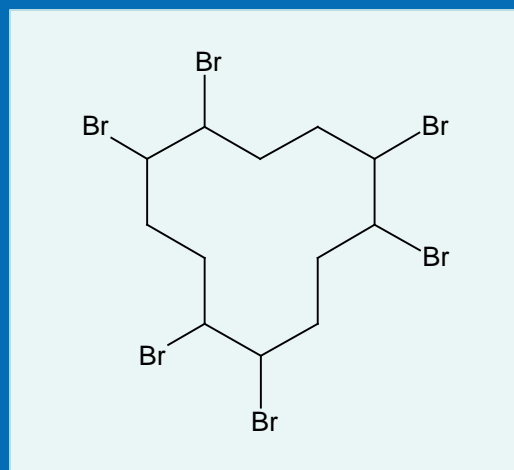


# Preliminary Materials for the IRIS Assessment of Hexabromocyclododecane (HBCD)

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Assessment Managers*



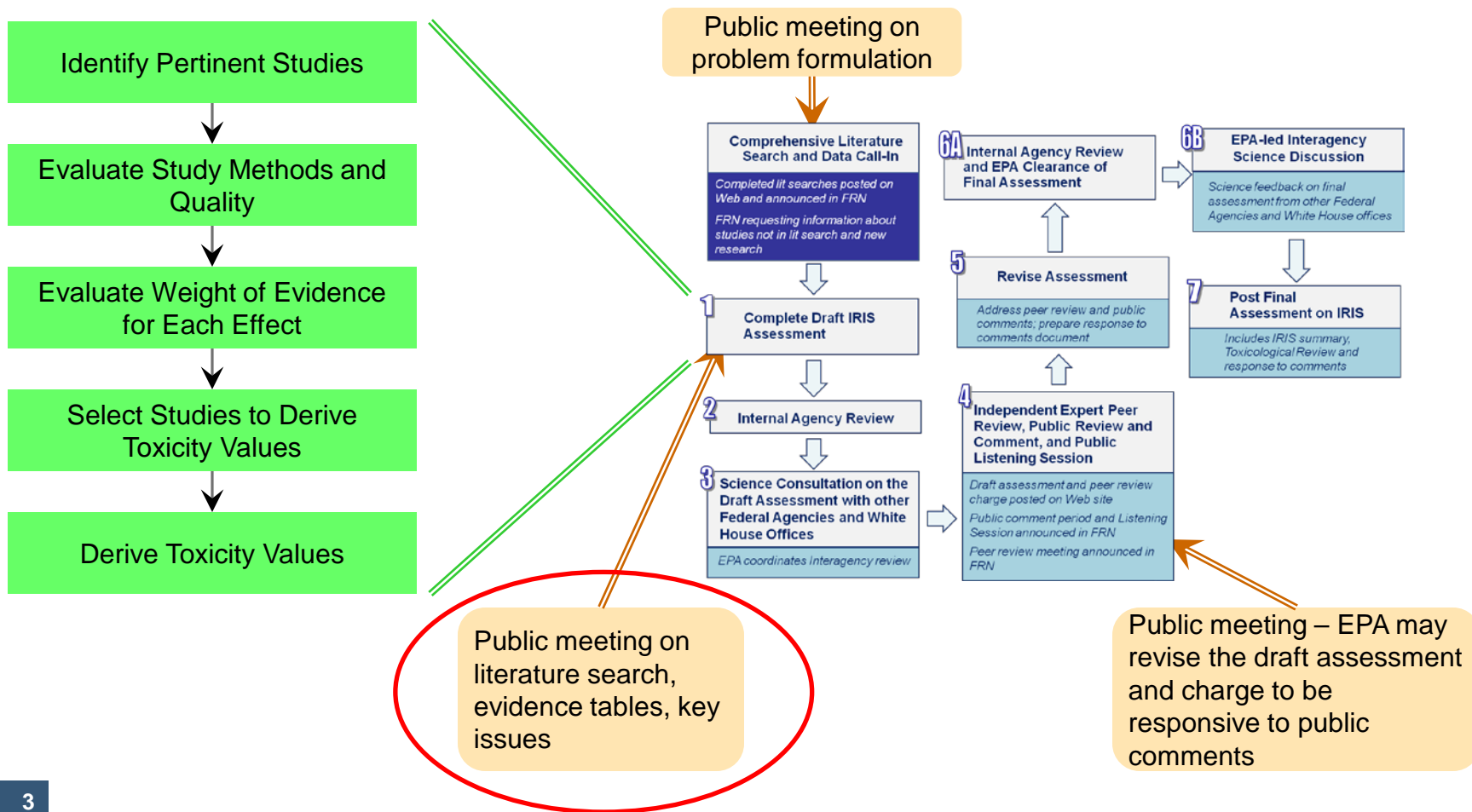
## General Information

- Brominated flame retardant used as:
  - Expanded polystyrene foam (EPS) and extruded polystyrene foam (XPS) produced for thermal insulation in the building and construction industry
  - Textile backcoatings for upholstered products
  - High impact polystyrene in electrical systems
- Persistent in the environment
  - Bioaccumulates in living organisms
  - Biomagnifies in the food chain
  - Lipophilic
  - Present in human breast milk

## Agency Interest in HBCD

- General population may be exposed via air, water, and food
- Action Plan – several rulemakings being considered under the Toxic Substances Control Act and the Toxics Release Inventory
- Design for the Environment program – assessing alternatives for major uses
- IRIS values could also be involved in:
  - Waste management and site cleanup
  - Development of fish advisories regarding consumption of contaminated fish
- Children are especially vulnerable
  - Exposed through breast milk
  - Ingestion of dust from placing objects in their mouth

# IRIS Assessments Invite Public Engagement



## Preliminary Materials for the IRIS Assessment of HBCD:

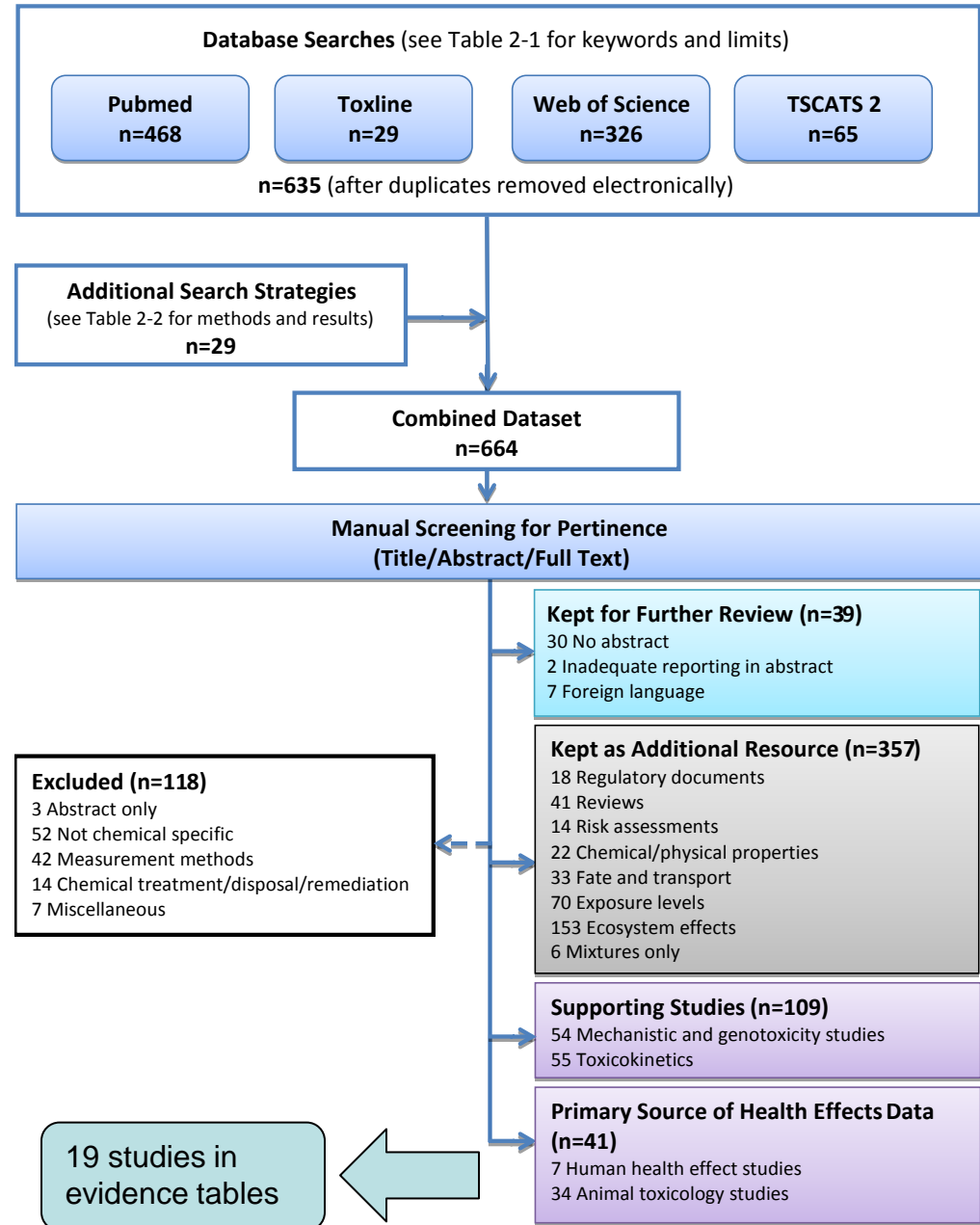
- Planning and scoping summary
- Draft literature search and screening strategy
- Evidence for hazard identification
  - Preliminary evidence tables
  - Preliminary exposure-response arrays
  - Inventory of mechanistic studies

\*These materials are available online at:

[http://epa.gov/iris/publicmeeting/iris\\_bimonthly-apr2014/mtg\\_agenda.htm](http://epa.gov/iris/publicmeeting/iris_bimonthly-apr2014/mtg_agenda.htm)

## Initial Literature Search and Screening Strategy

- More than 600 studies identified; 546 considered pertinent.
- 41 identified as primary sources of health effects data
- 19 extracted into evidence tables
  - Acute, sensitization, and irritation studies not included



## Features of the HBCD Database

- Animal data

	<b>Chronic</b>	<b>Subchronic</b>	<b>Two-Gen Repro/Dev</b>	<b>MOA Information</b>	<b>Toxicokinetics</b>
Oral	✓	✓	✓	✓	✓
Inhalation					

- Human data consist of cohort and cross-sectional studies

# Study Characteristics to be Considered during Evaluation and Synthesis

## Examples – Human Studies

- Exposure – Measurements preferred in adipose tissue, serum, and breast milk
- Outcome measures
  - Thyroid hormone – Time of day and season are two potential sources of variability
  - Neuropsychological/neurobehavioral – Use of standardized assessment tools
- Confounding – Age and sex

## Examples – Experimental Animal Studies

- Relies on EPA guidelines where available
- Exposure – Isomeric composition of the test material
- Outcome measures
  - Thyroid hormones – Timing of sample collection; gender differences
  - Neurological/neurobehavioral – Blinding in behavioral bioassays is preferred
  - Developmental - Evaluation of exposure during critical windows of organogenesis; maternal toxicity



The evidence tables present data for the following potential hazards:

- Thyroid effects
- Liver effects
- Neurological effects
- Developmental effects
- Reproductive effects
- Immune effects