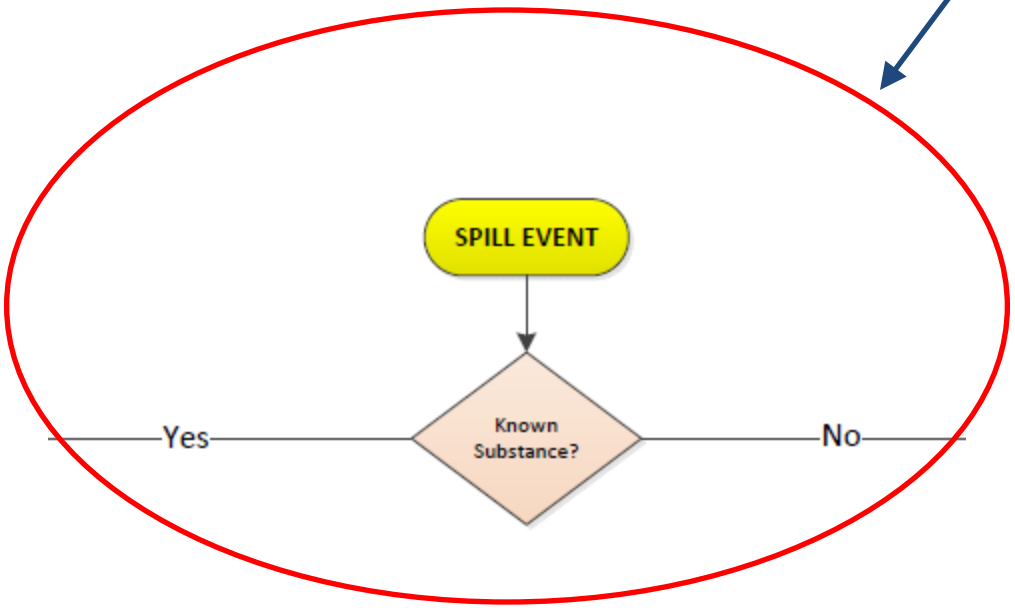
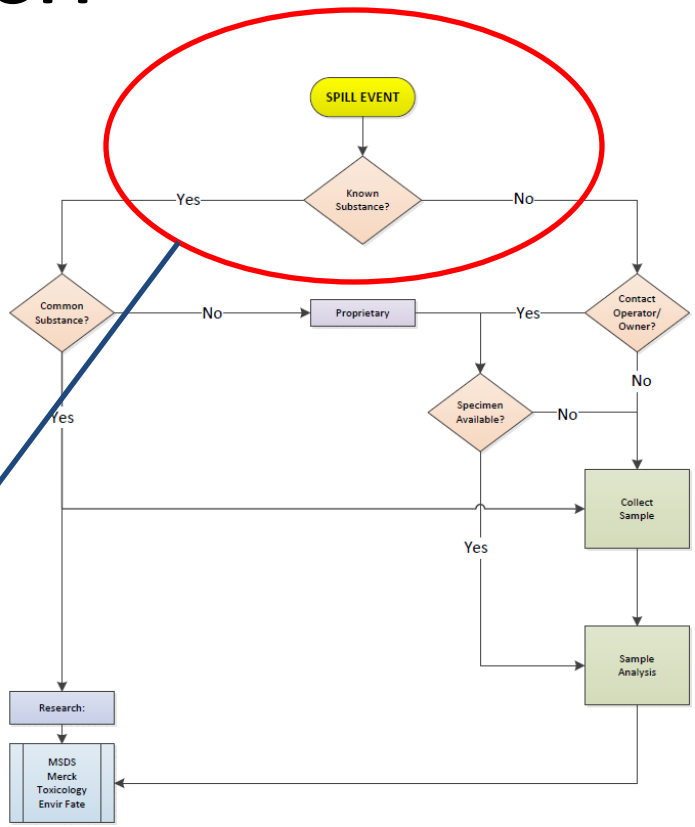
# Sources of Chemical Information

Emerging Contaminants Workgroup

# Approach

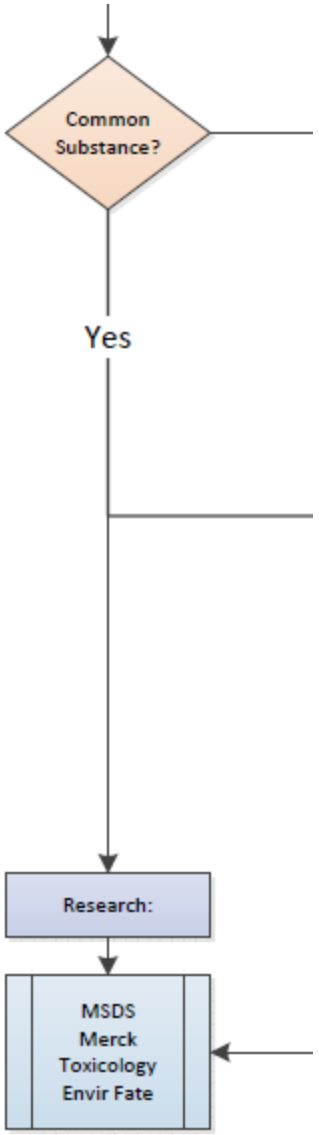
- Decision tree flowchart
  - Known vs. Unknown
  - Single substance vs. Blend or mixture



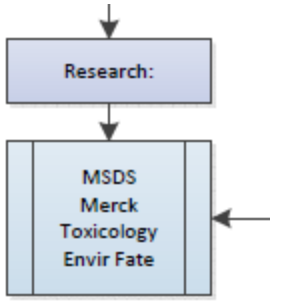
# Known & Common

- Check published and online data sources:
  - Material Safety Data Sheet (MSDS)
    - May be available for Commercial Products/Mixtures
  - Chemical desk reference (e.g., Merck Index)
    - Mainly for individual substances/not mixtures
  - EPA : Water Contaminant Information Tool (WCIT)



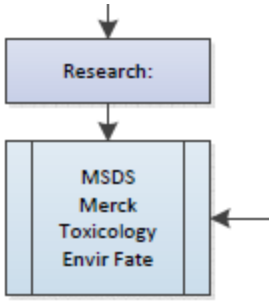
# Known & Common

- Check published and online data sources:
  - Industrial Hygiene data sources (some data intended for emergency response and occupational exposure)
    - NIOSH Pocket Guide
    - NIH-NLM **WISER** (Wireless Information System for Emergency Responders)
    - **CHRIS** (Chemical Hazard Response Information System)
    - DOT-PHMSA **ERG** (Emergency Response Guide, latest 2012)



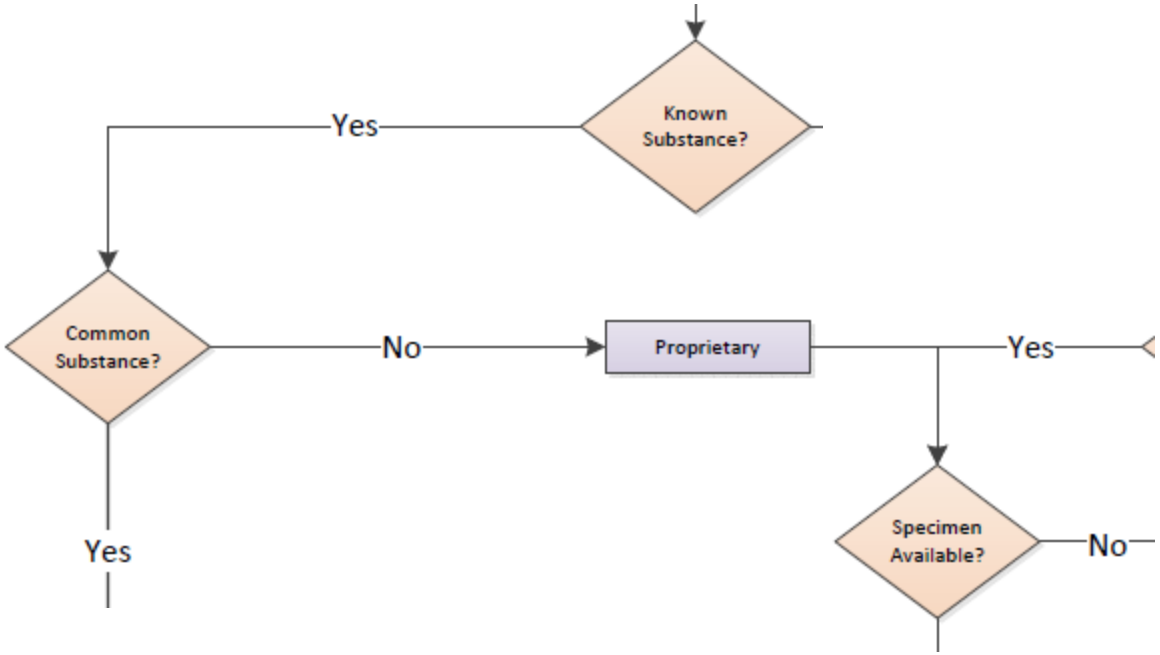
# Known & Common

- Check published and online data sources:
  - Toxicology sources
    - NIH TOXNET → HSDB, PubChem
    - USEPA → IRIS, ECOTOX
  - Environmental degradation rates:
    - Not all “common” substances are published
    - CHEMFATE, BIODEG
    - Handbook *Environmental Degradation Rates*
    - CDC → ATSDR



# Known Substance or Mixture

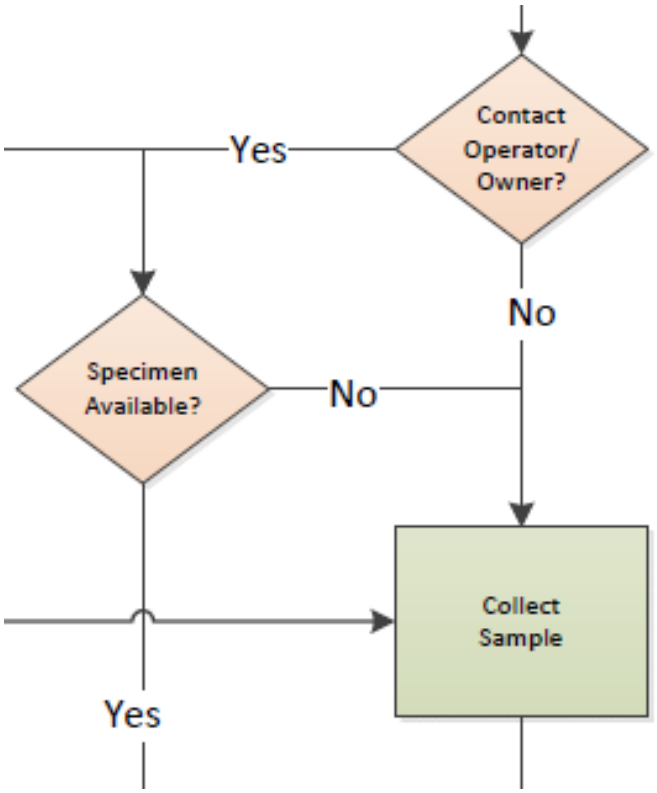
- Common or **Uncommon**:




  - If uncommon, is it proprietary?
  - If proprietary, can a specimen be provided?

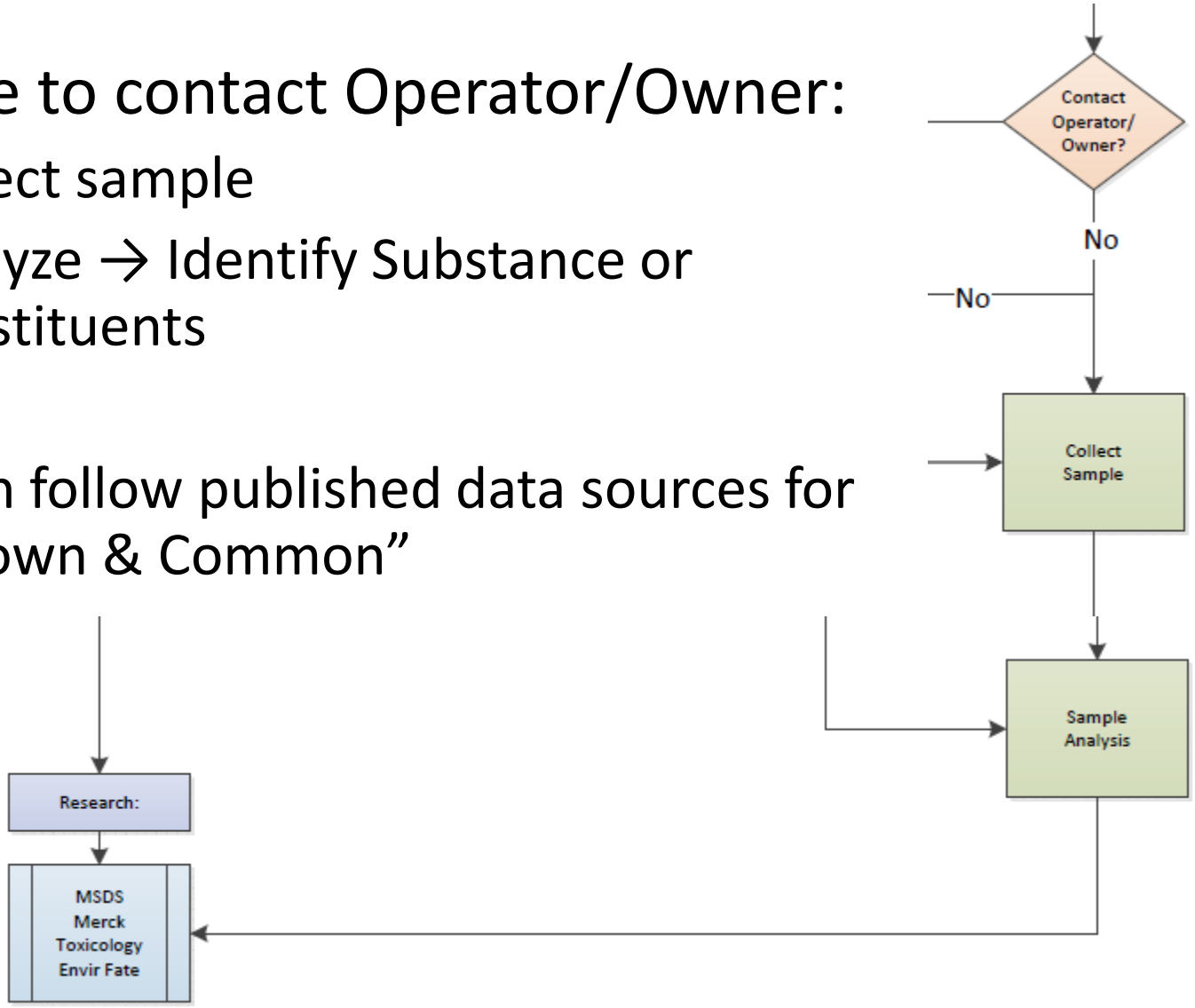
# Known & Uncommon

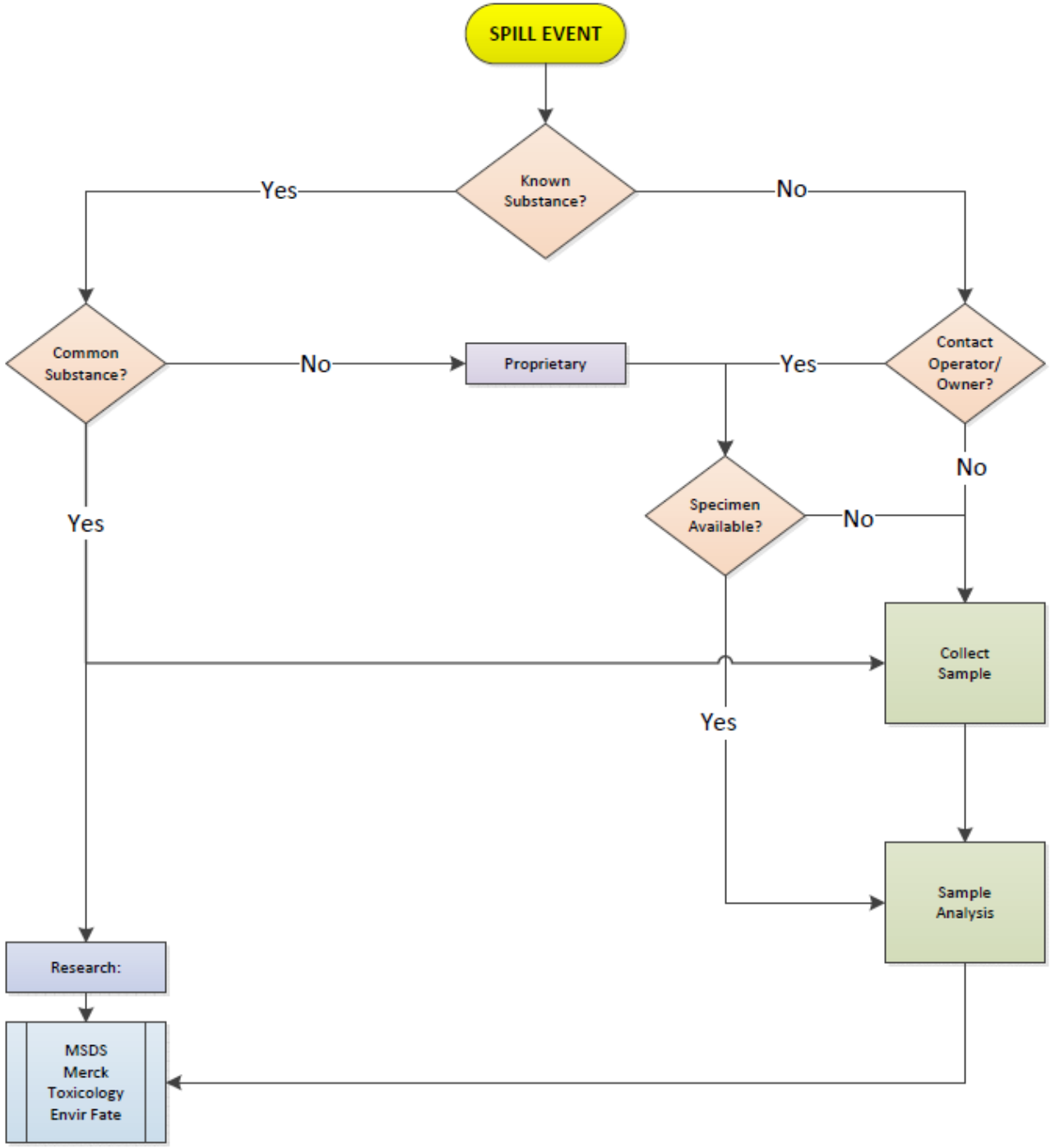
- Seek MSDS from Operator/Owner
- Request disclosure for proprietary mixture
- Request specimen for testing
- Collect sample if no specimen available (see Unknown)



# Unknown Substance or Mixture

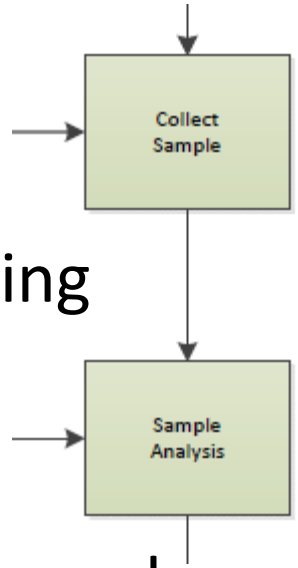
- Unable to contact Operator/Owner:
  - Collect sample
  - Analyze → Identify Substance or Constituents
  - Then follow published data sources for "Known & Common"




SPILL EVENT
Known Substance?
Yes
No
Common Substance?
No
Proprietary
Yes
Contact Operator/ Owner?
No
Yes
Specimen Available?
No
Collect Sample
Yes
Sample Analysis
Research:
MSDS
Merck
Toxicology
Envir Fate

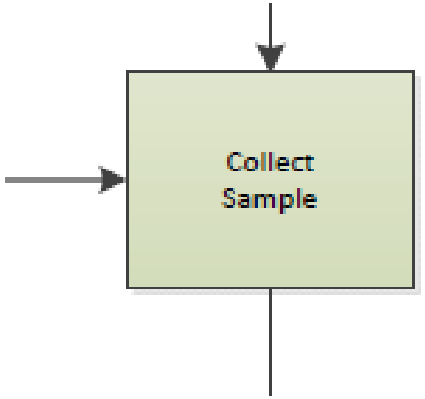
# Unknown Substance or Mixture

- No MSDS or supplied specimen available → **Collect sample**
  - How far downstream from point of spill?
  - Are there any observations/reports (assuming visible impact)?
  - Where to sample? Is it accessible?
  - Need preliminary time-of-travel estimate (based on flow)

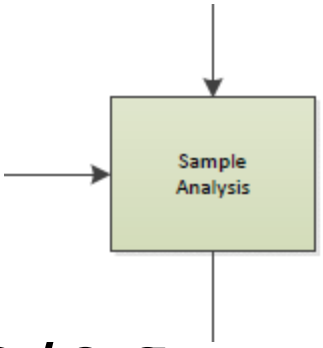


# Sampling Challenges (esp. for Unknowns)

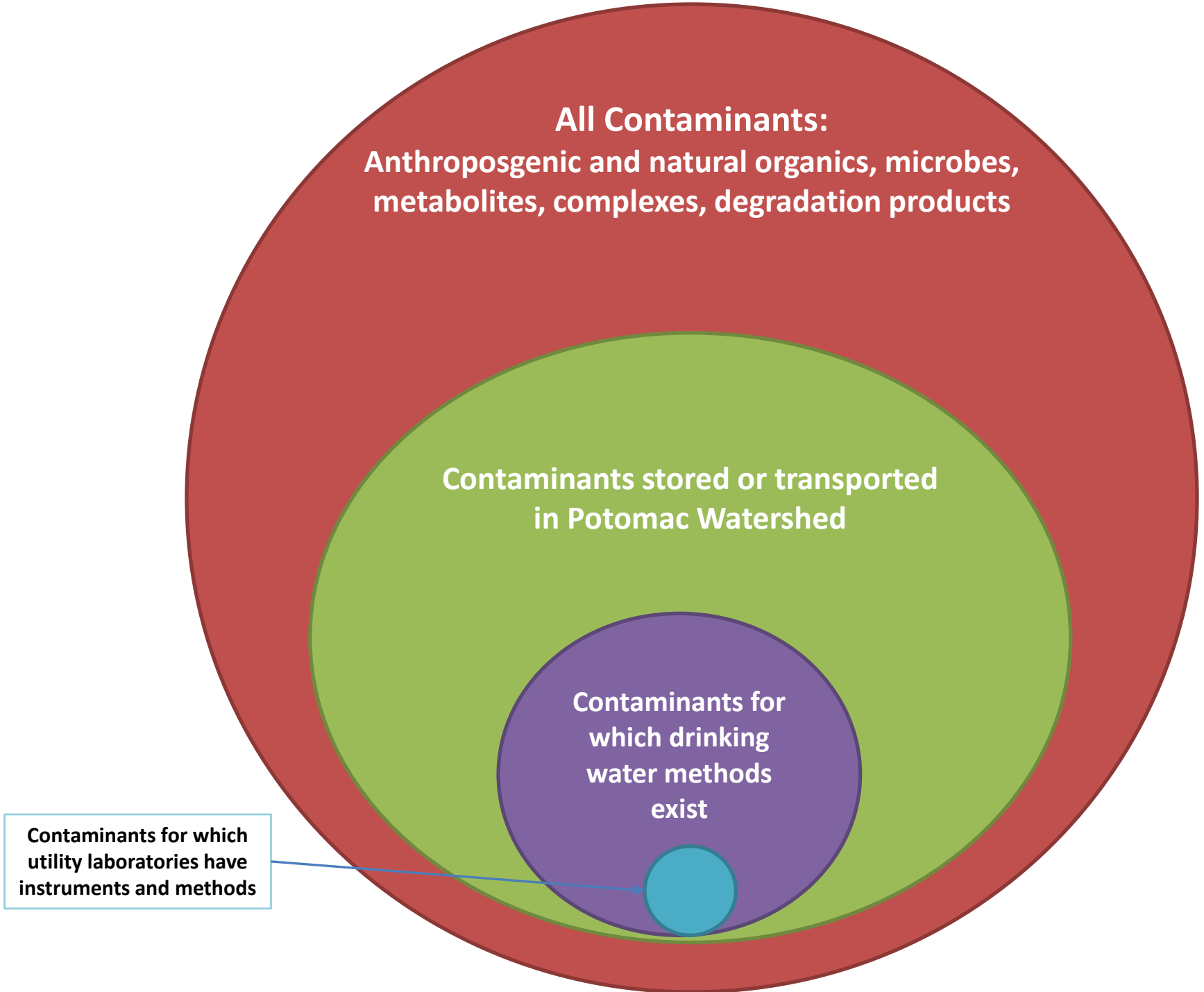
- Container (glass, HDPE, nalgene) and chemical compatibility?
- Field/lab filtration?
- Volume collected?
- Preservative?
- Holding time? Delivery?



# Analytical Challenges (esp. for Unknowns)




- Federal, State or local government lab (e.g., WSSC)? Or private?
- Analytical methods for detection?
  - Universe of substances/compounds ~100,000
  - Known substances ~10,000 (in databases)
  - Analytical methods ~500+
- Can lab meet expedited turnaround time?
- Are MDL and RDL sufficient for potentially diluted sample?


All Contaminants:
Anthroposgenic and natural organics, microbes, metabolites, complexes, degradation products
Contaminants stored or transported in Potomac Watershed
Contaminants for which drinking water methods exist
Contaminants for which utility laboratories have instruments and methods

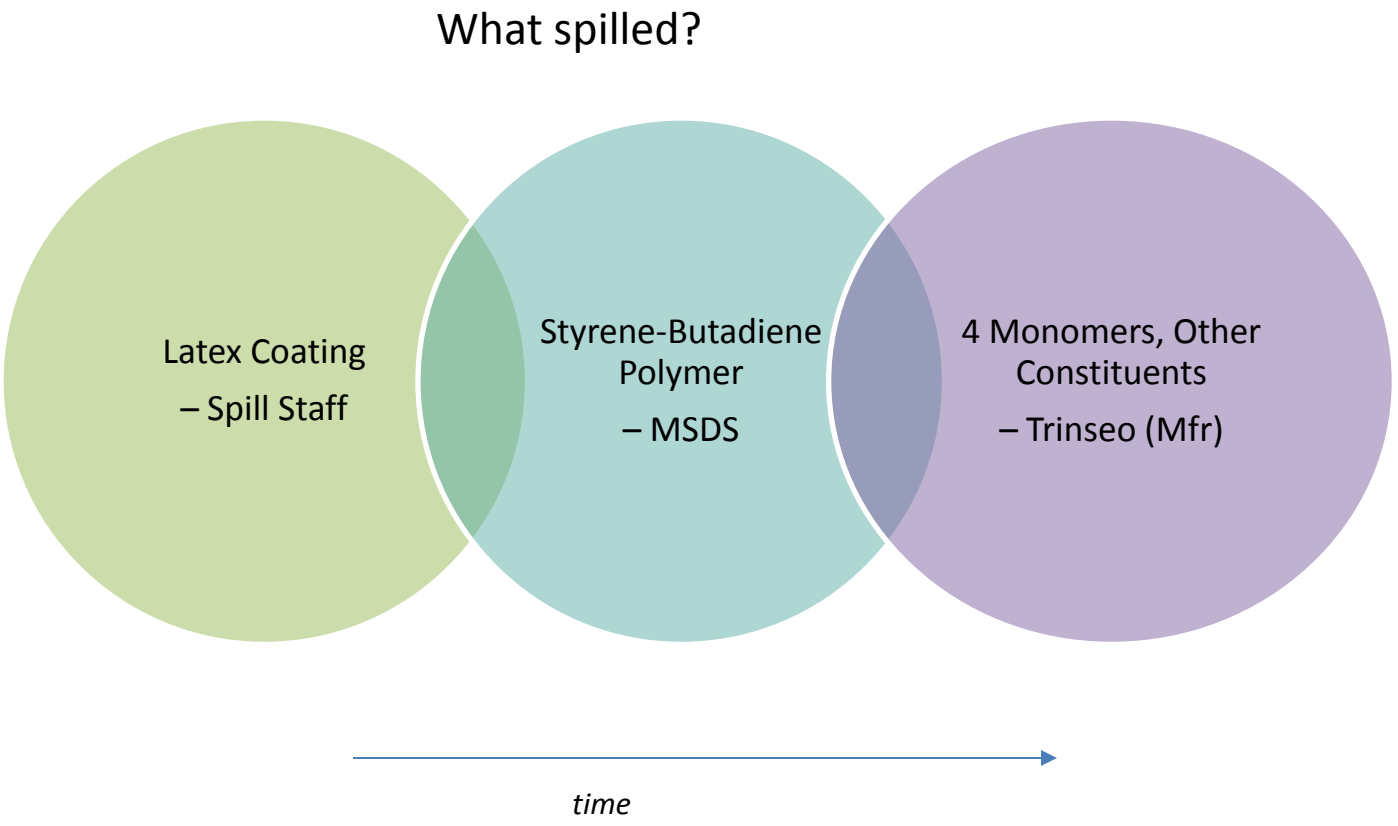
# Use of Published or Analytical Results

- Is substance toxic in drinking water?
  - What level?
- Is substance hazardous for human or ecological contact?
  - Beware during sample collection
- Is substance likely to degrade in sunlight/UV?
  - How fast?
- Are dilution, volatilization important factors?
- **Who makes decisions about hazard/risk**?

# Latex Spill – Relatively Simple Situation

- Low river flowrate (initially) – time to react
- Cooperative manufacturer sent MSDS, sample, and technical support
- Known contaminant – latex coating
- Low toxicity substance (styrene-butadiene latex polymer often provides the chew in chewing gum)
- Labs routinely monitor styrene, a regulated contaminant
- Visible plume – allowed sampling from river

# Latex spill constituents and sources of information



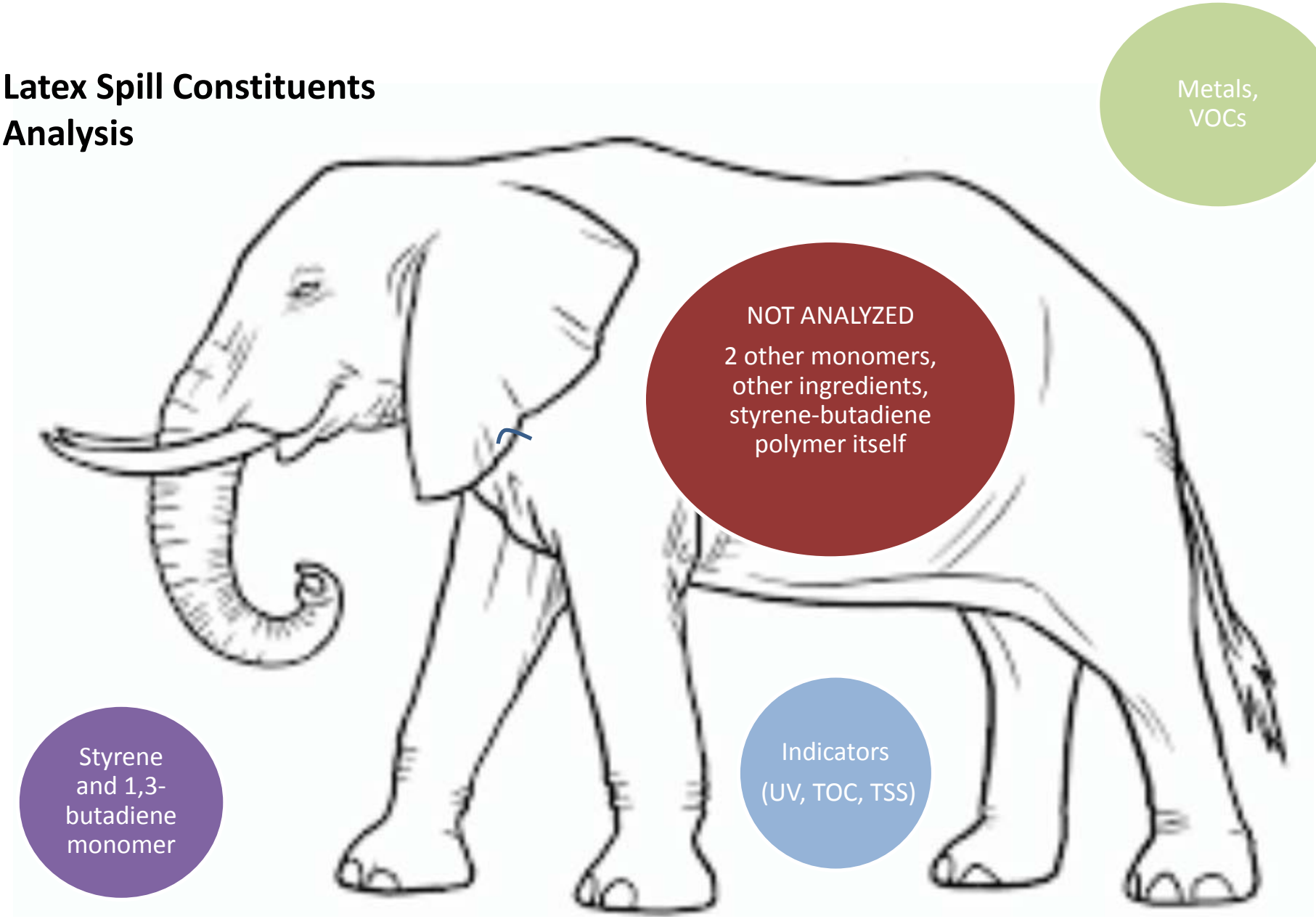
# Latex Spill Nuances

- How much time to learn about contaminant?

  Paw Paw (hours) vs Washington Aqueduct (days)

  - Location of spill compared to intakes
  - River flow, weather (Nor'easter and Hurricane)
- MSDS limitations; more details from mfr
- Analytical methods available only for styrene, butadiene but not latex polymer itself or other constituents/ additives
- ICPRB spill model conc. cut off at "<1 ppm"
  - Styrene regulated at 0.1 mg/L
- Treatability information not available for product
- Laboratory response protocols not implemented

# Latex Spill Constituents Analysis



# Preparedness Improvements – EPA's DWMAPS

- **Drinking Water Mapping Application for Protecting Source Waters (DWMAPS)**
- DWMAPS is an internet-based GIS tool for drinking water source water protection and assessment.
  - Nationwide mapping tool
  - A customizable source water protection planning tool
  - Suite of data exchange services to help ensure safe drinking water
- Currently for EPA use
- Future use:
  - State agencies, drinking water utilities, source water collaboratives, watershed groups, and others

FY2016-2017 National Water Program Guidance (EPA 420-R-15-008)

# Preparedness Improvements - WaterSuite

- Ongoing update of DC's 2002 source water assessment (by ICPRB) of Potomac watershed
  - Sponsored by MWCOG, contractor is Corona
  - Includes National Capitol Area utilities
  - Focus on chemicals that can spill and travel to intakes quickly
  - Ongoing negotiations about
    - Regional availability (entire watershed)
    - Use by ICPRB, regulators, etc.

# Potential Role of Emerging Contaminants Workgroup

- Provide liaisons as WaterSuite and DWMAPS evolve
- Promote regional understanding of Laboratory Response Network and laboratory role in incident response
- Promote improved understanding of contaminant information tools (e.g., MSDS, WCIT, etc.)
- Review and post information on toxicity, analysis methods, treatability, etc. to databases