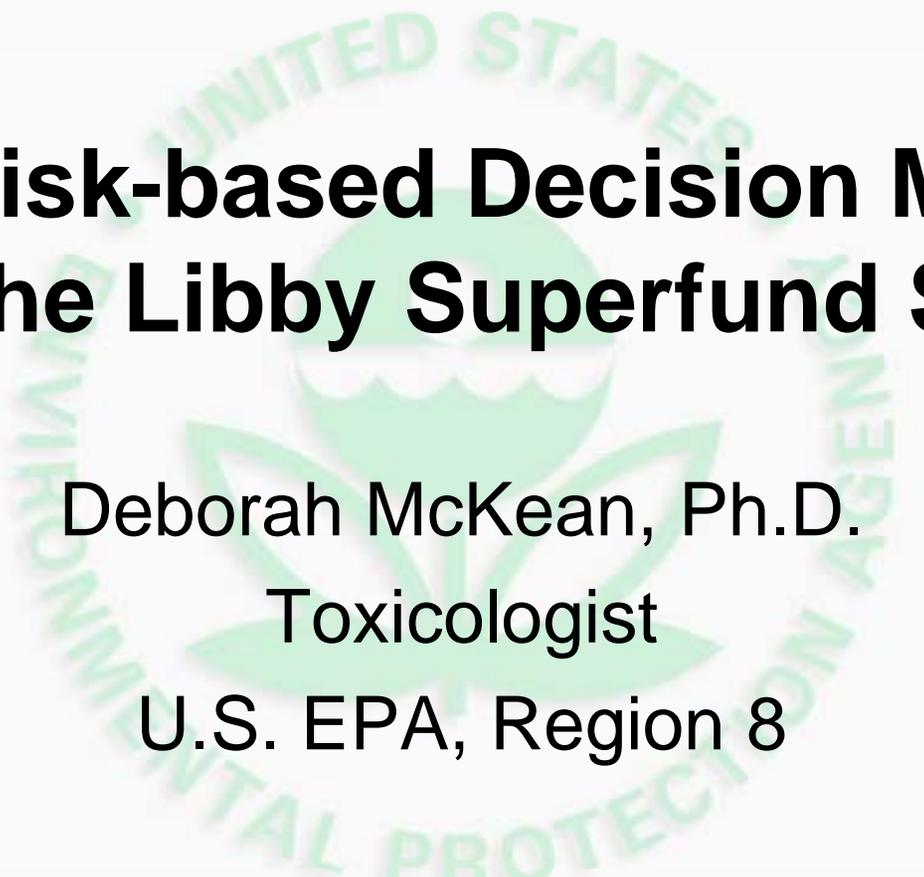




# **EPA Risk-based Decision Making at the Libby Superfund Site**



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# Introduction

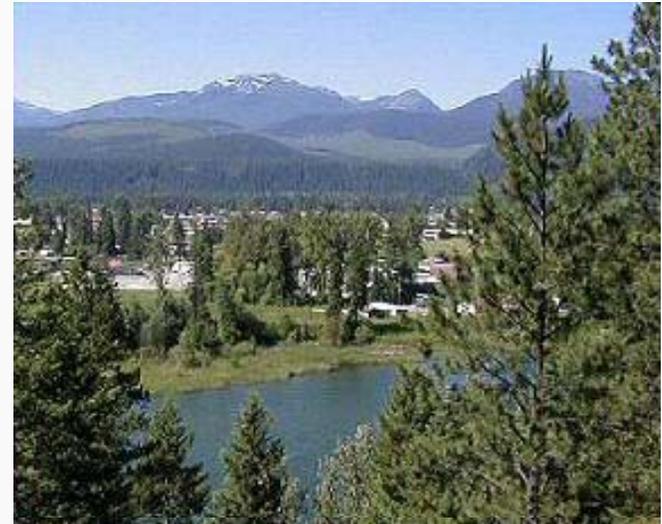


- Libby Montana Superfund Site
- EPA Superfund human health risk assessment for asbestos exposures
- Use of toxicity values in risk-based decision making

# Libby Montana Superfund Site



- Libby Montana Superfund Site
  - 12,000 people within 10 miles
    - Libby - approx. 2600
    - Troy - approx. 1000



- Vermiculite mining: 1920's to 1990
- Only declared Public Health Emergency
- EPA removal actions ongoing since 1999

# Community Health Effects (ATSDR 2002)



- Asbestosis mortality
  - 165% higher incidence in vermiculite workers
- Pleural abnormalities
  - >30% incidence with >10 exposure pathways
  - >50% incidence in vermiculite workers and their family members
- Lung Cancer and Mesothelioma
  - 20 to 30% higher incidence of lung cancer
  - 15 mesothelioma deaths in vermiculite workers

# Risk-based Decision Making



“Remediation goals shall establish acceptable exposure levels that are protective of human health and the environment” (40 CFR – National Contingency Plan):

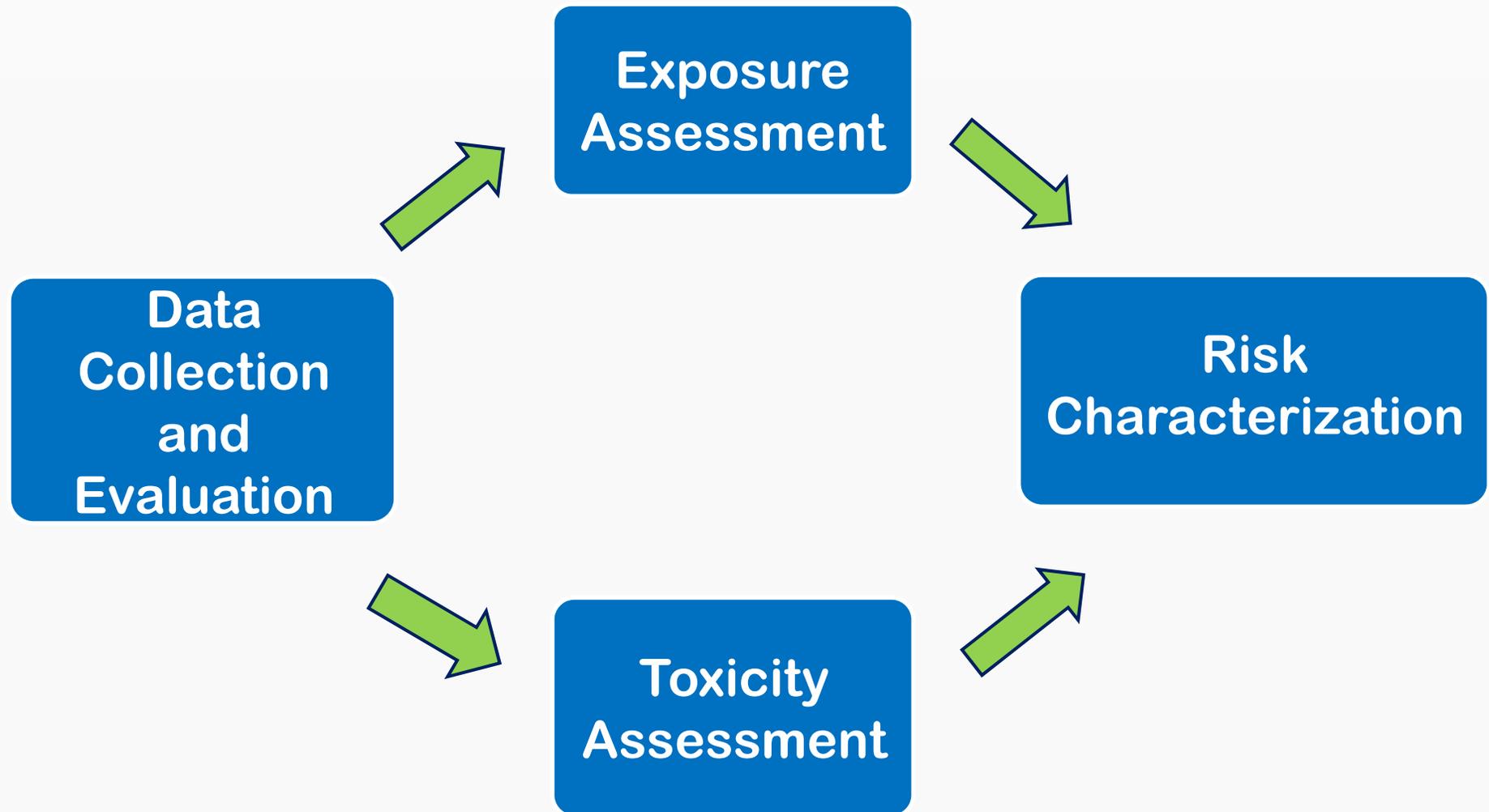
- “For systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime.....”
- “For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between  $10^{-4}$  and  $10^{-6}$  using information on the relationship between dose and response.”

# Objectives of a Site-specific Risk Assessment



- Help determine the need for action
- Provide a basis for contaminant levels that are protective of public health
- Provide a basis for cleanup decisions
- Process for evaluating and documenting public health threats

# Four Steps of a Risk Assessment



# Exposure



- Activities that 'disturb' soil or dust contribute to asbestos in air
- Activity-based sampling used to estimate environmental exposure to asbestos (structures/cc in air)
- Activities evaluated include, for example:

Gardening	Playing in yard
Housework	Playing at school
Lawn mowing	Quiet home activities
Driving	Classroom activities
Digging	Worker activities

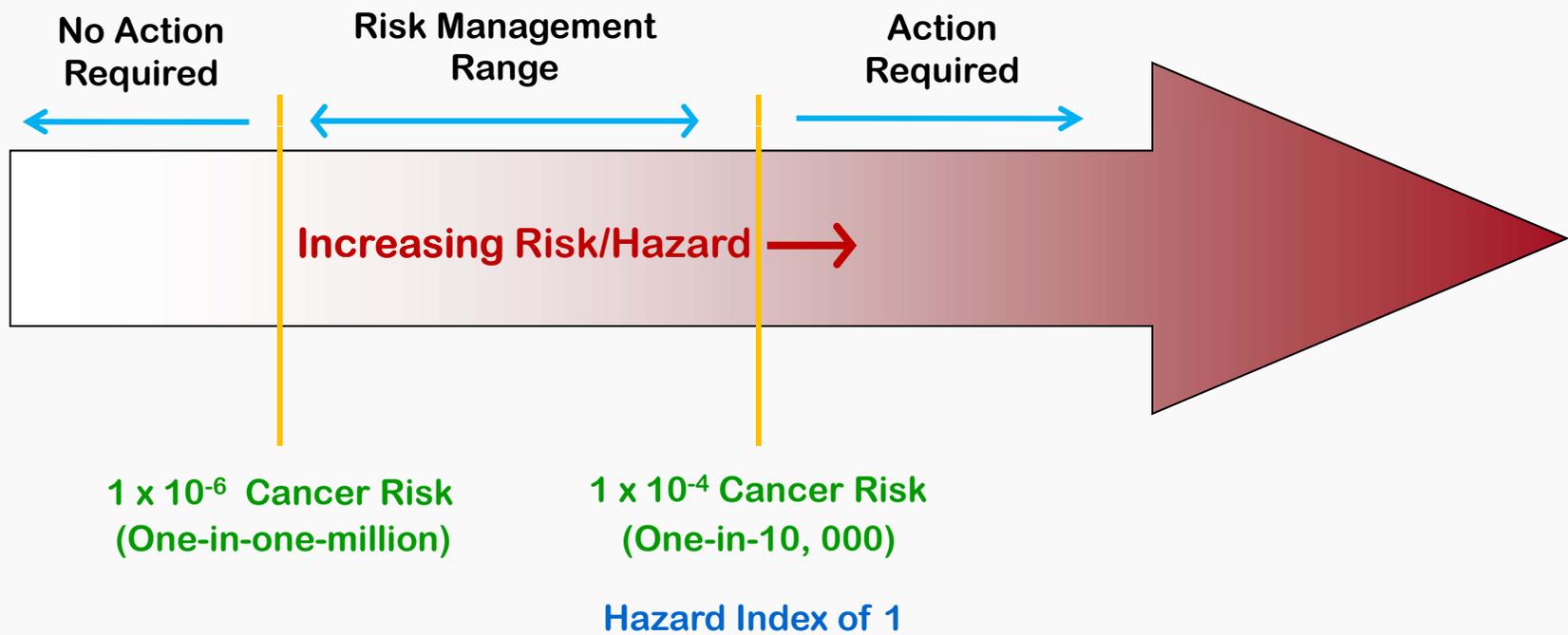


# Cumulative Exposure



- Asbestos exposures persist throughout a lifetime in the Libby valley (captive population)
- Total Libby asbestos exposure for Libby valley residents:
  - Childhood exposures
    - Ambient air **plus**
    - Yard playing **plus**
    - Indoor and outdoor school exposures...
  - Teenage exposures
    - Ambient air **plus**
    - Indoor and outdoor (sports) school exposures **plus**
    - Part-time jobs...
  - Adult exposures
    - Ambient air **plus**
    - Yard work **plus**
    - House work **plus**
    - Occupational exposures...

# Risk Assessment/Risk Management Interface



# Risk Management: Considerations Impacting Decision-Making



- Risk reduction
- Regulatory mandates
- Long-term effectiveness
- Reduction of hazard through treatment
- Short-term effectiveness
- Implementability
- Cost
- State and local acceptance
- Community acceptance

# Summary



- EPA strives for cleanup decisions that are site-specific and risk-based
  - Exposure data is site-specific while toxicity assessment is agent-specific
  - Risk-based information supports the Cumulative Risk Assessment and Record of Decision (ROD) for site
- Asbestos exposure in the Libby valley is cumulative across time and activity
  - Libby community exposures associated with multiple exposure pathways
  - Epidemiology data demonstrates multiple adverse outcomes directly related to asbestos exposures
- EPA toxicity values must be protective not predictive