

FRESHWATER DATA NEEDS FOR GENERATION OF  
NUMERICAL FRESHWATER CRITERIA FOR SELECTED CHEMICALS

A Report Submitted to Battelle-Columbus  
Laboratories in Partial Fulfillment of Task 1  
For Work Assignment No. 45 on U.S.  
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The freshwater literature on aquatic toxicity and bioconcentration/bioaccumulation has been critically reviewed for selected chemicals as identified under Task 1 of work assignment no. 45. Modifications of the original work plan as agreed upon with Battelle, include the addition of anthracene to the list of polycyclic aromatic hydrocarbons and the substitution of acenaphthene for beryllium. The following freshwater data needs have been identified.

#### 1,2,4-Trichlorobenzene

##### 1. Acute toxicity tests:

- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A member of a family in any order of insect or any phylum not already represented (e.g. Bryozoan, Coelenterate, etc.).
- A fish from a family other than Centrarchidae, Salmonidae, or Cyprinidae, or an amphibian.

#### Hexachlorobenzene

##### 1. Acute toxicity tests:

- An insect not in the order Diptera.
- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
- A member of a family in any order of insect or any phylum not already represented (e.g. Bryozoan, Coelenterate, etc.).

##### 2. Acute and chronic tests:

- A fish species.
- An invertebrate species.

2,4,5-Trichlorophenol

## 1. Acute toxicity tests:

- A fish in the family Salmonidae.
- A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
- An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A member of a family in an order of insect or phylum not already represented (e.g. Bryozoa, Coelenterate, etc.).

## 2. Acute and chronic tests:

- A fish species.
- An invertebrate species.

4-Chloro-3-methylphenol

## 1. Acute toxicity tests:

- A member in the family Salmonidae
- A member in a family in the phylum Chordata other than Salmonidae or Cyprinidae.
- A planktonic crustacean (e.g. cladoceran, copepod, etc.).
- A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
- An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A member of a family in any order of insect or any phylum not already represented.

2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.
4. A bioconcentration test.

#### Acenaphthylene

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - One other member of a family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).
  - A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.
2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.

Benzo(a)pyrene

## 1. Acute toxicity tests:

- A member of the family Salmonidae.
- One other member of a family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).
- A third family in the phylum Chordata (e.g. fish, amphibian, etc.).
- A benthic crustacean (e.g. cladoceran, copepod, etc.).
- An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A member of a family in any order of insect or phylum not already represented.

## 2. Acute and chronic ratios:

- A fish species.
- An invertebrate species.

Phenanthrene

## 1. Acute toxicity tests:

- A member of the family Salmonidae.
- A member of a third family in the phylum Chordata (other than Salmonidae or Cyprinidae).
- A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
- A member of a family in an order of insect or phylum not already represented.

2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.

### Anthracene

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of a third family in the phylum Chordata (other than Salmonidae or Centrarchidae).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or phylum not already represented.
2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.

### Pyrene

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of one other family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).

- A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in any order of insect or any phylum not already represented.
2. Acute and chronic tests:
    - A fish species.
    - An invertebrate species.
  3. An algal or vascular plant toxicity test.

#### 2,3,7,8-Tetrachlorodibenzofuran

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of one other family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).
  - A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.

2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.
4. A bioconcentration test.

#### Octachlorodibenzofuran

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of one other family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).
  - A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.
2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.
4. A bioconcentration test.



Bis-2-ethylhexyl phthalate (di-2-ethylhexyl phthalate)

## 1. Acute toxicity tests:

--A member of the family Salmonidae.

--A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).

--A member of a family in any order of insect (not Diptera) or any phylum not already represented (e.g. Mollusca, Coelenterata, etc.).

## 2. Acute and chronic tests:

--An invertebrate species (suggest Cladoceran).

--One species of fish or invertebrate from a family not already tested.

Butylbenzyl phthalate

## 1. No acute toxicity tests needed.

## 2. Acute and chronic tests:

--A fish species.

Diethyl phthalate

## 1. Acute toxicity tests:

--A member of the family Salmonidae.

--A member of one other family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).

--A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).

--A planktonic crustacean (e.g. cladoceran, copepod, etc.).

--A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).

--An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).

- A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.
2. Acute and chronic tests:
    - A fish species.
    - An invertebrate species.
  3. An algal or vascular plant toxicity test.

#### Dimethyl phthalate

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of one other family (preferably a commercially or recreationally important warmwater species) in the class Osteichthyes (e.g. bluegill, channel catfish, etc.).
  - A member of a third family in the phylum Chordata (e.g. fish, amphibian, etc.).
  - A planktonic crustacean (e.g. cladoceran, copepod, etc.).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.

2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.

#### Organotin (tributyltin)

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A member of a third family in the phylum Chordata (other than Salmonidae or Centrarchidae).
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or phylum not already represented.
2. Acute and chronic tests:
  - A fish species.
  - An invertebrate species.
3. An algal or vascular plant toxicity test.
4. A bioconcentration test.

Acenaphthene

1. No toxicity tests needed.
2. No acute-chronic ratios needed.
3. An algal or vascular plant toxicity test.

Antimony

1. Acute toxicity tests:
  - A member of the family Salmonidae.
  - A benthic crustacean (e.g. ostracod, isopod, amphipod, crayfish, etc.).
  - An insect (e.g. mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge, etc.).
  - A member of a family in a phylum other than Arthropoda or Chordata (e.g. Rotifera, Annelida, Mollusca, etc.).
  - A member of a family in any order of insect or any phylum not already represented.
2. No acute-chronic ratios needed.
3. An algal or vascular plant toxicity test.

Acrolein

1. No acute toxicity tests needed.
2. Acute and chronic tests:
  - A fish species.