Risk

- Risk Depends on:
  - Exposure
  - Toxicity

Exposure

- How can you be exposed to PCBs?
  - Ingestion
  - Inhalation
  - Dermal Absorption
- Primary Exposure Route at NBH:
  - Fish Consumption

Exposure

- How much exposure depends on:
  - Concentration in fish, air etc.
  - Frequency of Exposure, for example:

    Fish – number of meals per year

    Air – number of hours, days of exposure
  - Duration of Exposure
    - Number of years

Toxicity

- Cancer effects
  - Probability of cancer
  - For example, 1 in 100,000
- Noncancer effects
  - Comparison to a health-based reference level

Cancer Risk

- Increased probability of getting cancer over a lifetime from exposure to site
- Cancer slope factor **x** exposure dose
- EPA Risk Range
  - 1 in a million to 1 in ten thousand chance
  - 1 in 1,000,000 to 1 in 10,000
  - 1E-06 to 1E-04
  - 1×10^{-6} to 1×10^{-4}

Noncancer Hazard

- Compares site exposure to level without appreciable risk
- Hazard Index = $\frac{\text{Site Exposure}}{\text{Reference Dose}}$
- HI $\leq$ 1, adverse effect unlikely

Risk-based Air Concentrations

- Resident
  - Child and Adult
  - 24 hours per day
  - 350 days per year

- Worker in Commercial Areas
  - Adults
  - 24 hours per day
  - 250 days per year

Risk-based Air Concentrations

Residential Areas

- Noncancer effects
  - 110 ng/m^3
- Cancer Risk ($1x10^{-5}$)
  - 409 ng/m^3

Commercial Areas

- Noncancer effects
  - 260 ng/m^3
- Cancer Risk ($1x10^{-5}$)
  - 894 ng/m^3

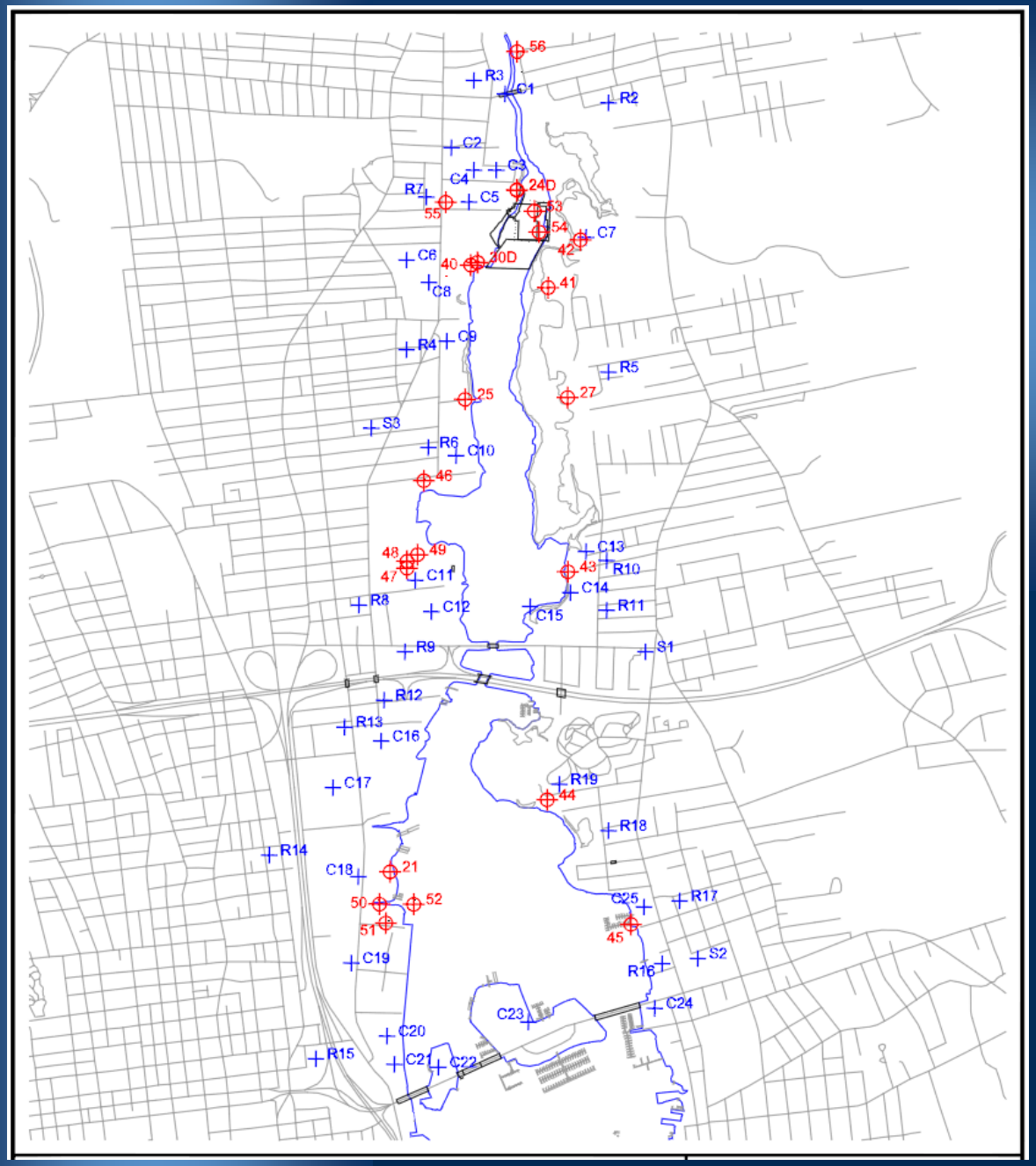
Comparison of Modeled and Risk-Based Air Concentrations

Modeled Annual Averages

- Residential
  - CAD Activity - 0.207 ng/m^3
  - All sources - 4.765 ng/m^3
- Commercial
  - CAD Activity - 1.488 ng/m^3
  - All sources – 32.754 ng/m^3

Risk-Based Concentrations

- Residential
  - 110 ng/m^3
  - 409 ng/m^3
- Commercial
  - 260 ng/m^3
  - 894 ng/m^3



Monitoring Locations And Receptors

Air Monitoring Station

Discrete Receptors

Comparison of Cancer Risks