Initial Risk Assessment for Interim Remedial Measures at the Cranston, RI Site

December 13, 1994

Prepared for:

ciba

ptr environmental services

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SEMS DocID 666744

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Prepared for:

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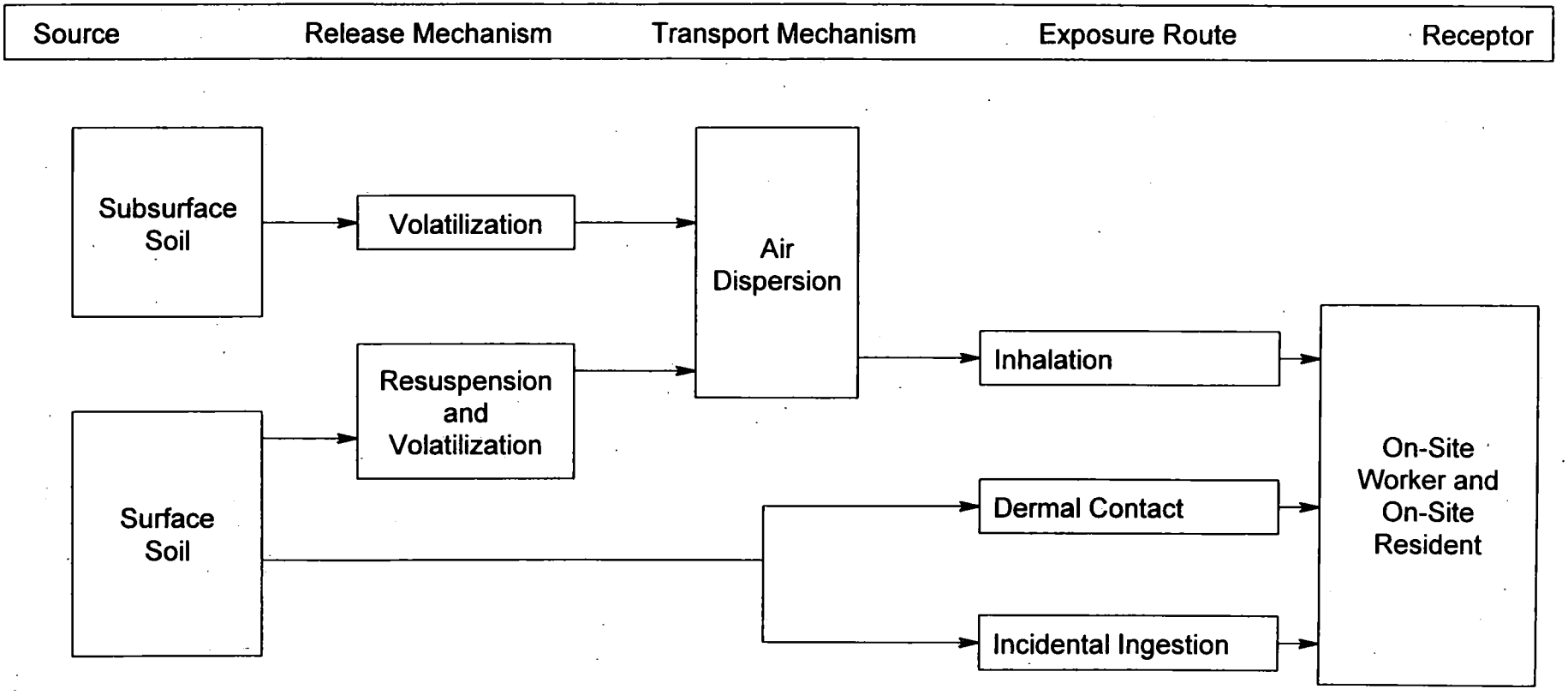
OVERVIEW

- Risk-based approach
- Initial baseline risk assessment results
- Comparison of on-site polyaromatic hydrocarbon (PAH) concentrations with background
- Recommended media protection standards

INITIAL BASELINE RISK ASSESSMENT

- Followed published USEPA guidance
- Followed guidance provided by Region I in May 1994 on Cranston Site
- Evaluated on-site worker and resident
- Assumed no corrective actions
- Assumed no potable use of site groundwater
- Used 95% upper confidence limit of mean soil concentrations

Cranston Site Exposure Model



Project No. 1.003.03
12/13/94

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Exposure Assumption Values for Cranston Site*

EPA (RAGS) recommends

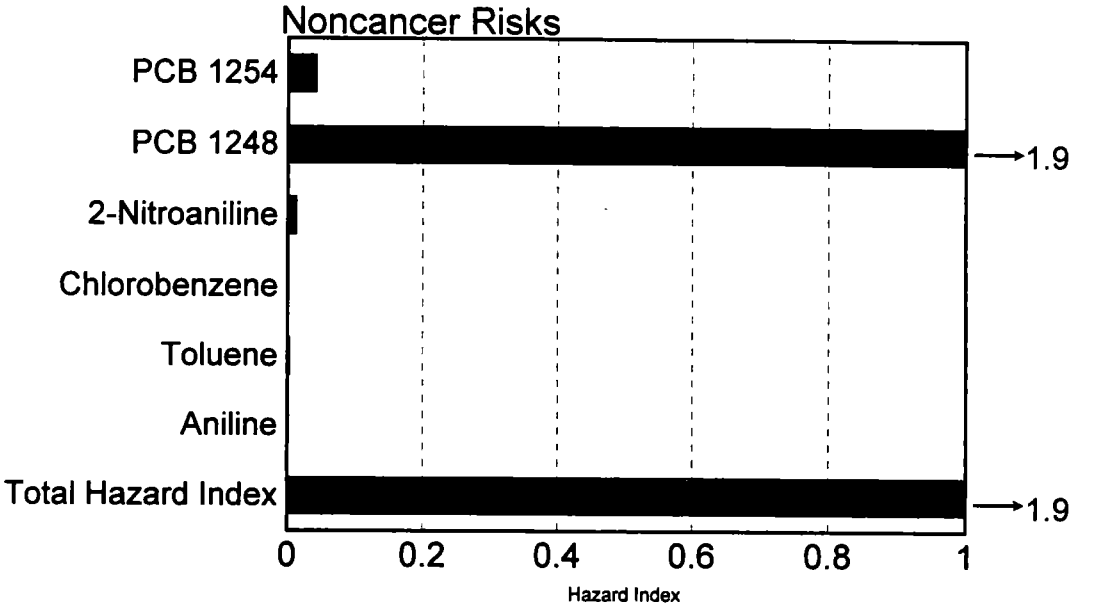
Parameter	Units	Exposure Values	
		On-Site Worker	On-Site Resident
Body Weight	kg	70	70/15
Exposure Frequency	(events/yr)	155	215
Conversion Factor	(kg/mg)	1×10^{-6}	1×10^{-6}
Exposure Duration	yrs	25	30 24/6
Exposure Time	(hr/event)	8	16
Soil Ingestion Rate	(mg/event)	50 100	200 (child) 100 (adult)
Ingested Fraction Originating from Source	none	1	1
Inhalation Rate	(m^3/hr)	2.5 6.5	0.6/0.3 13
Body Surface Area Exposed to Soils	(cm^2/event)	2,000 5,000	1,000(child) 2,000(adult) 2000 5000
Soil Adherence Factor	(mg/cm^2)	0.2 1	0.2 1
Averaging Time-Noncancer	days	9,125	10,950

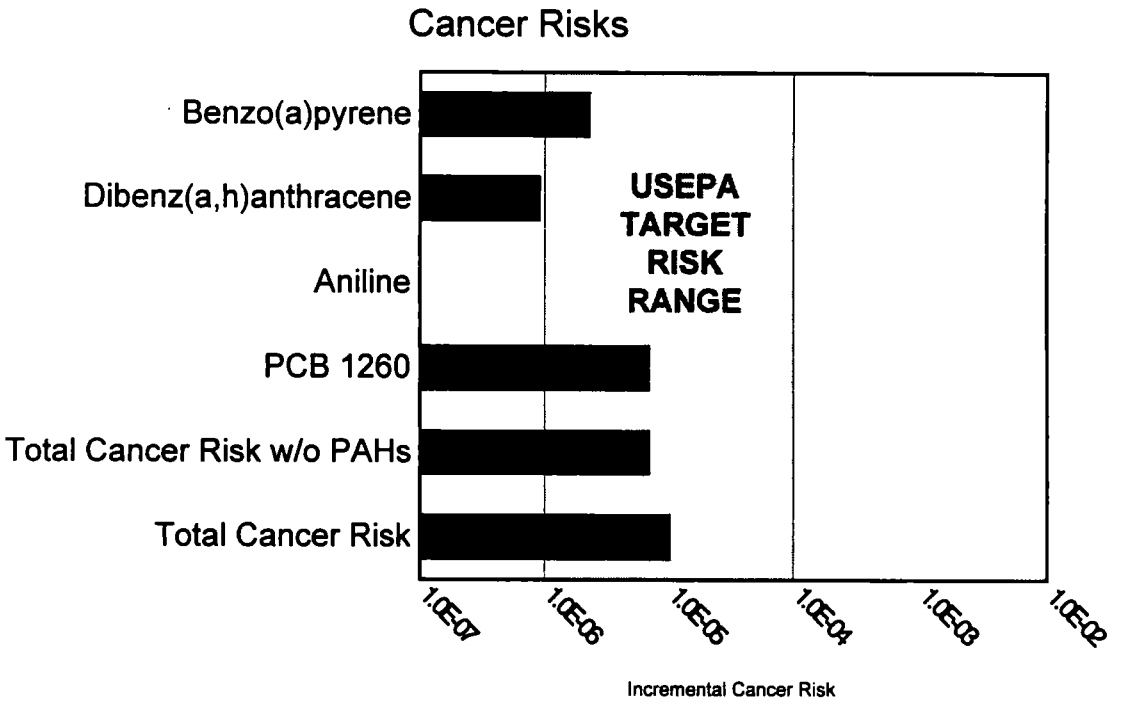
*Assumptions include guidance provided by USEPA Region I in May, 1994 meeting.

INITIAL RISK ASSESSMENT CONCLUSIONS

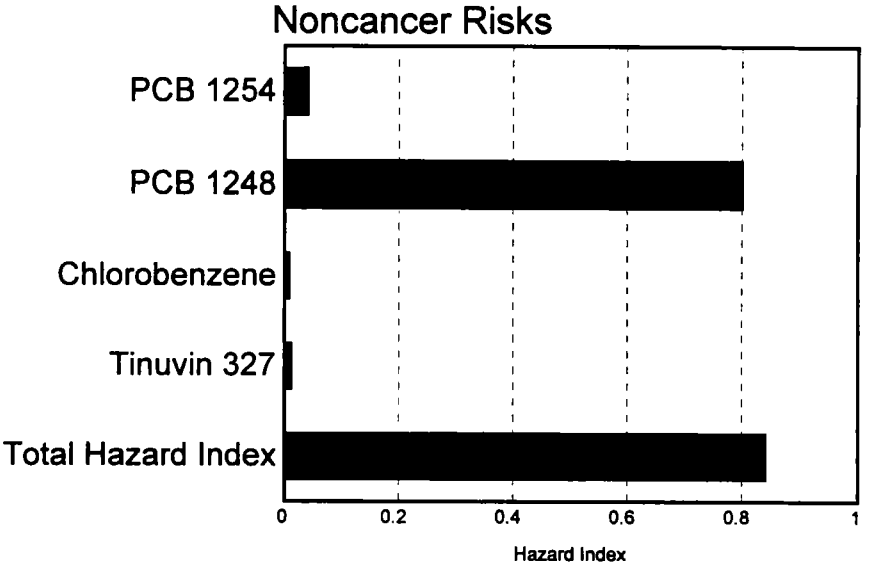
- No incremental cancer risks exceed USEPA target range
- On-site PAH concentrations do not exceed background
- Hazard index exceeds limit of "1" only for Production Area on-site worker

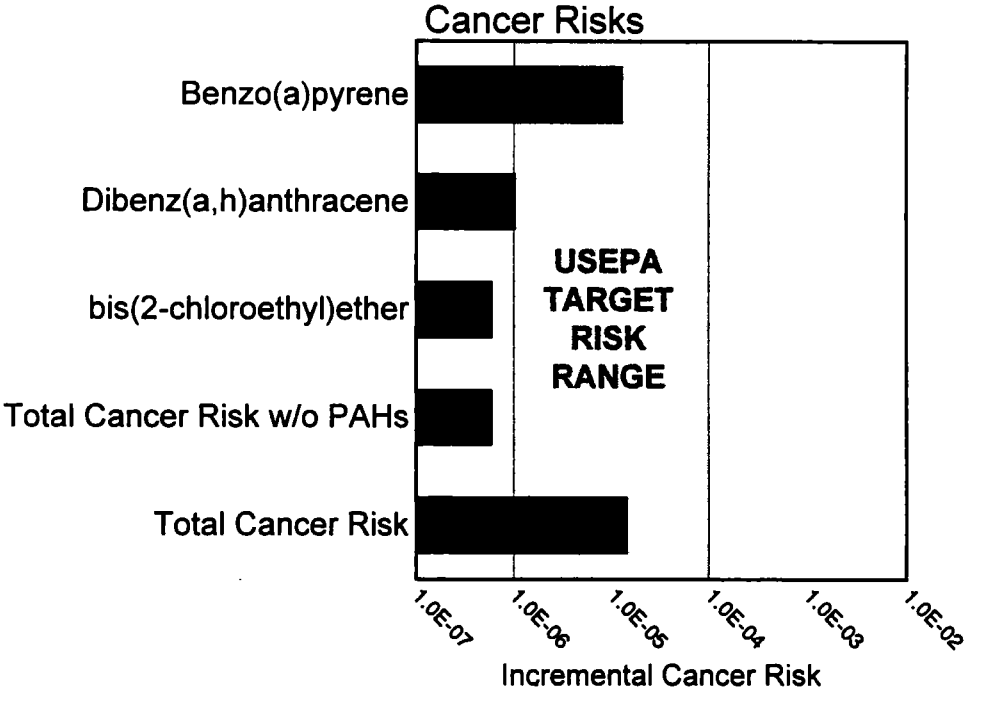
Risk Summary for Production Area
On-Site Worker Scenario





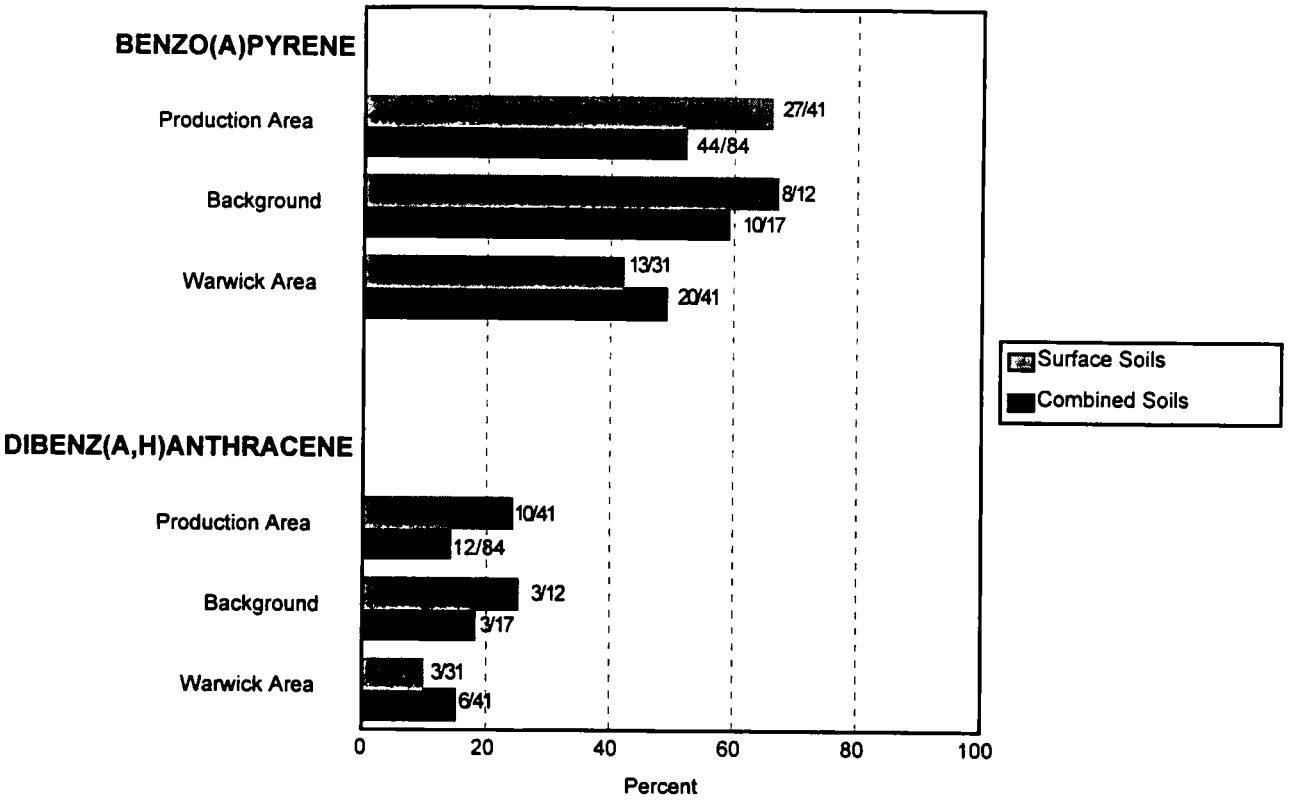
Risk Summary for Warwick Area
On-Site Residential Scenario



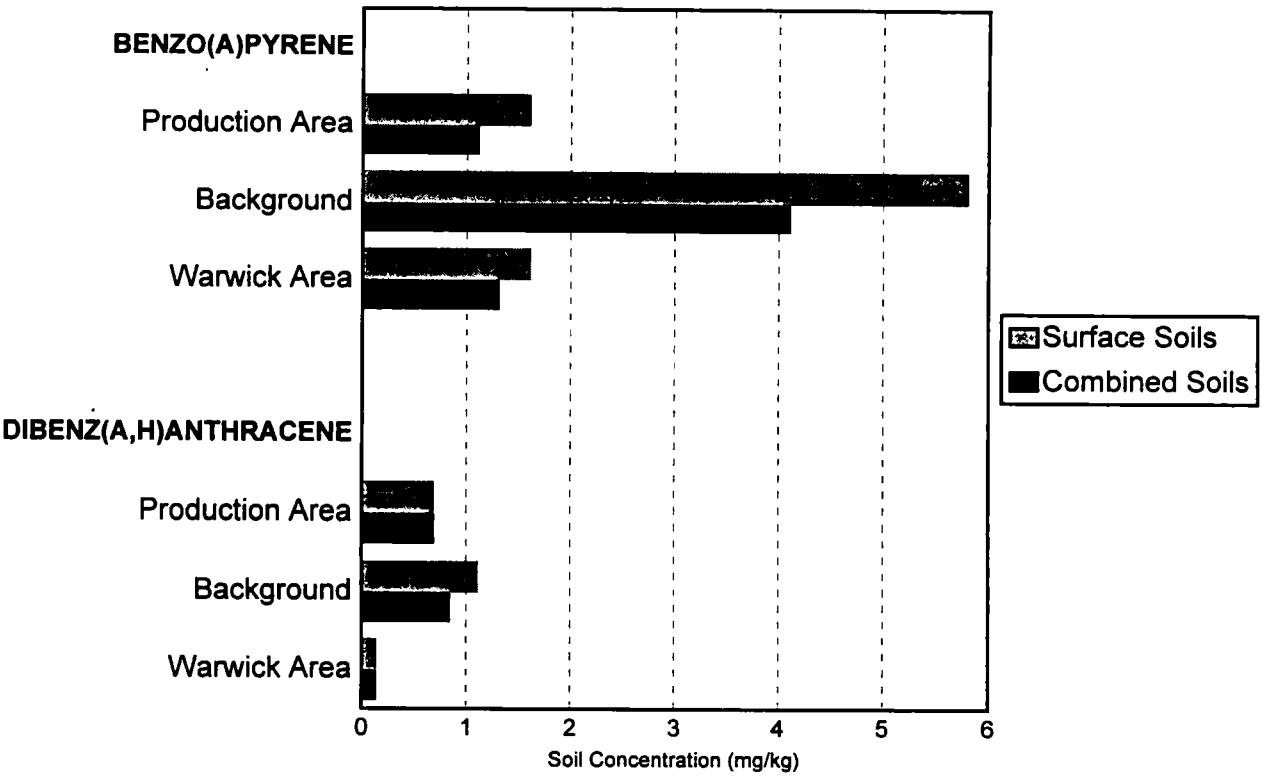


Comparison of PAH Soil Data

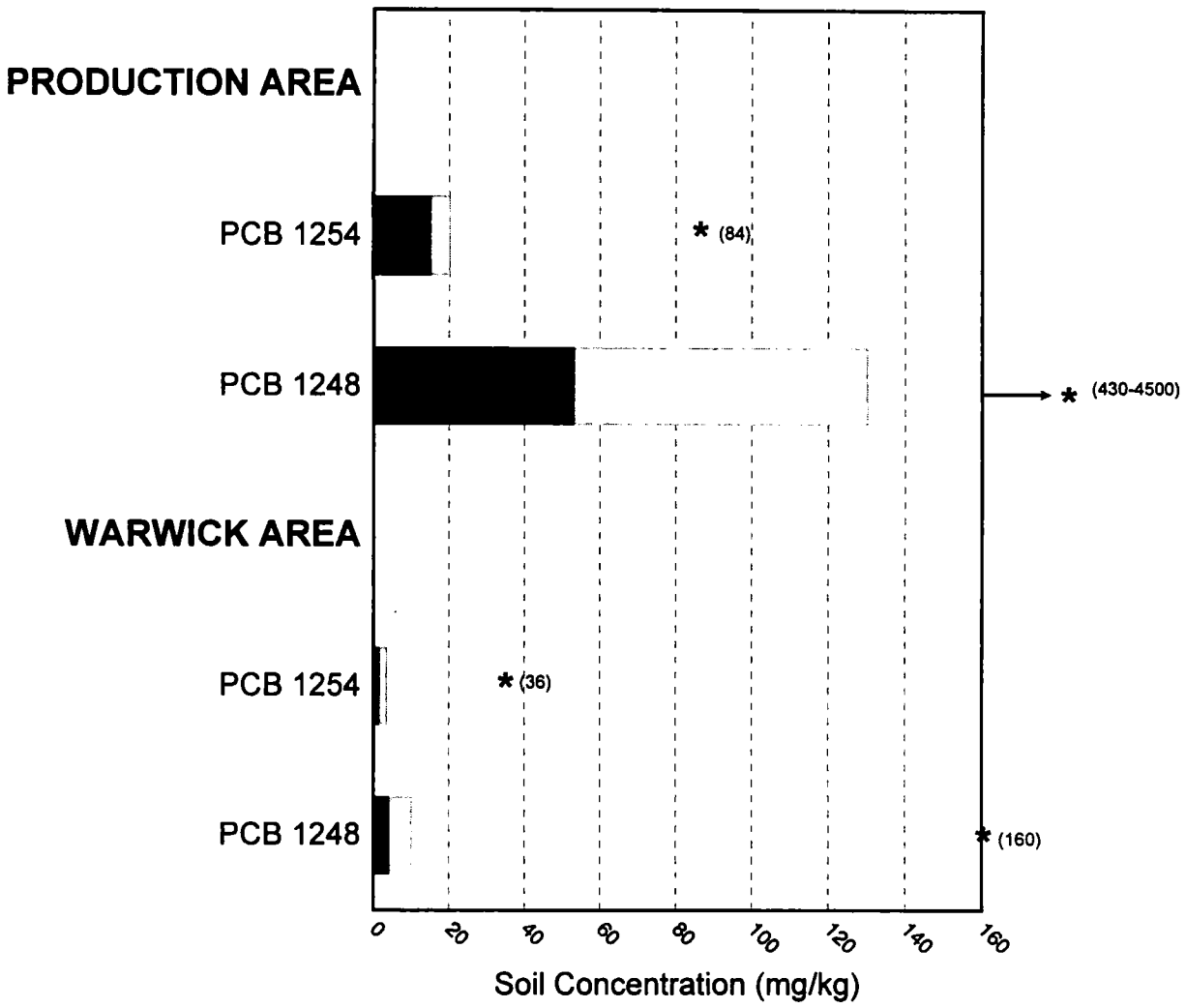
Frequency of Detection



Upper-Bound Mean Concentration



Range of PCB Concentrations



■ Mean Concentration

□ 95% Upper Confidence Limit

* Maximum Concentration

SOIL MEDIA PROTECTION STANDARDS

- Risk-based

- "Back-calculated" using risk assessment models

- Production Area: Commercial use
  - → PCB 1248: 50 mg/kg
  - → PCB 1254: 43 mg/kg

cumulative 93 mg/kg

- Warwick Area: Residential use
  - → PCB 1248: 9 mg/kg
  - → PCB 1254: 8 mg/kg

17 mg/kg