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Things to Consider When Assessing Contaminant Bioaccessibility

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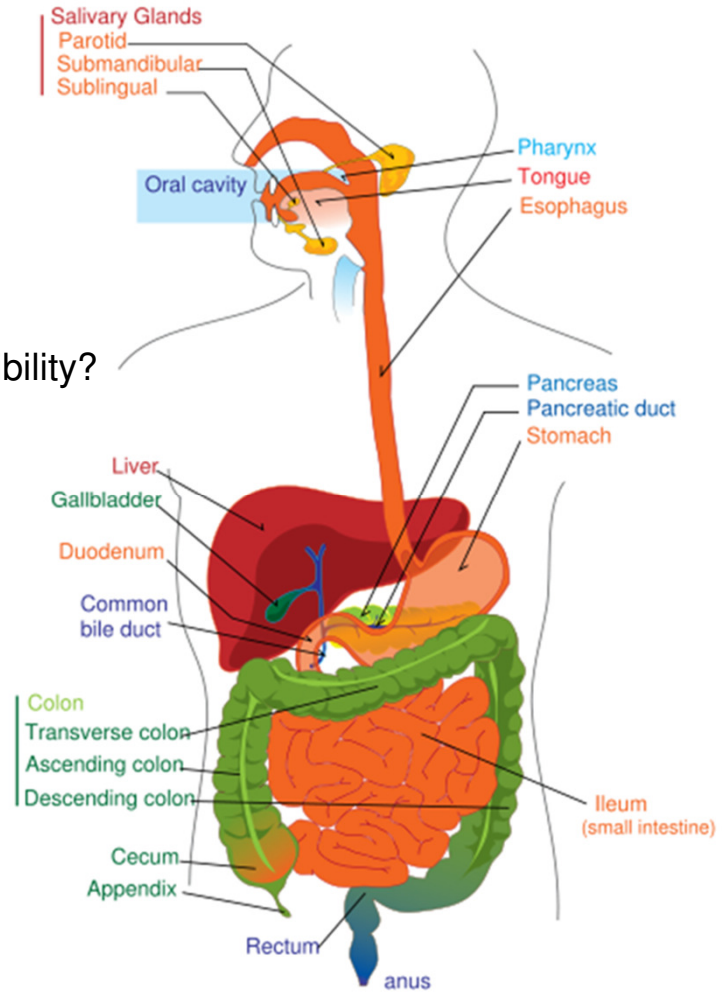
Things to Consider When Assessing Contaminant Bioaccessibility

- When is it appropriate to consider bioaccessibility assessment?
  - Key CoC
  - Refining exposure
  - Informing remediation criteria
- Are there reliable methods for assessing contaminant bioaccessibility?
  - Peer reviewed methodologies
  - ASLP, TCLP are not appropriate
  - Averaging values over multiple phases is not appropriate
  - Artefacts may be caused by the in vitro assay
  - For HOC, a sorption sink should be utilised
- Are methods correlated / validated with in vivo data?
- If not, what is the relevance of the method for the CoC?



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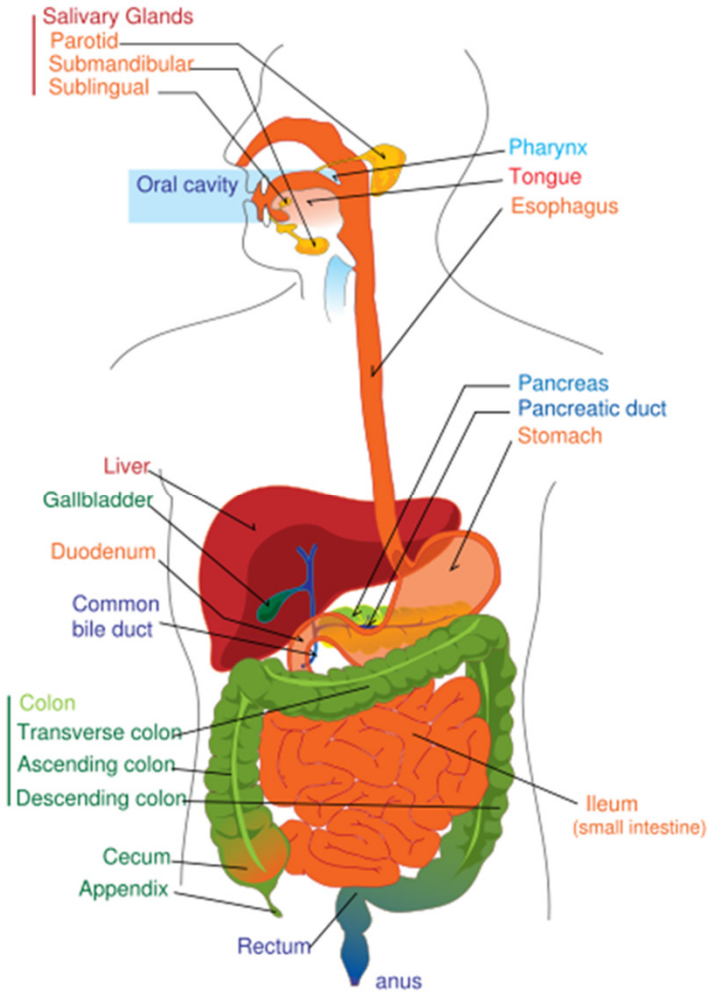
Things to Consider When Assessing Contaminant Bioaccessibility

- Logistical issues
  - SOP
  - Sample processing
  - pH tolerance
  - Assay mixing
  - Inclusion of blanks, duplicates and reference materials
  - Data interpretation



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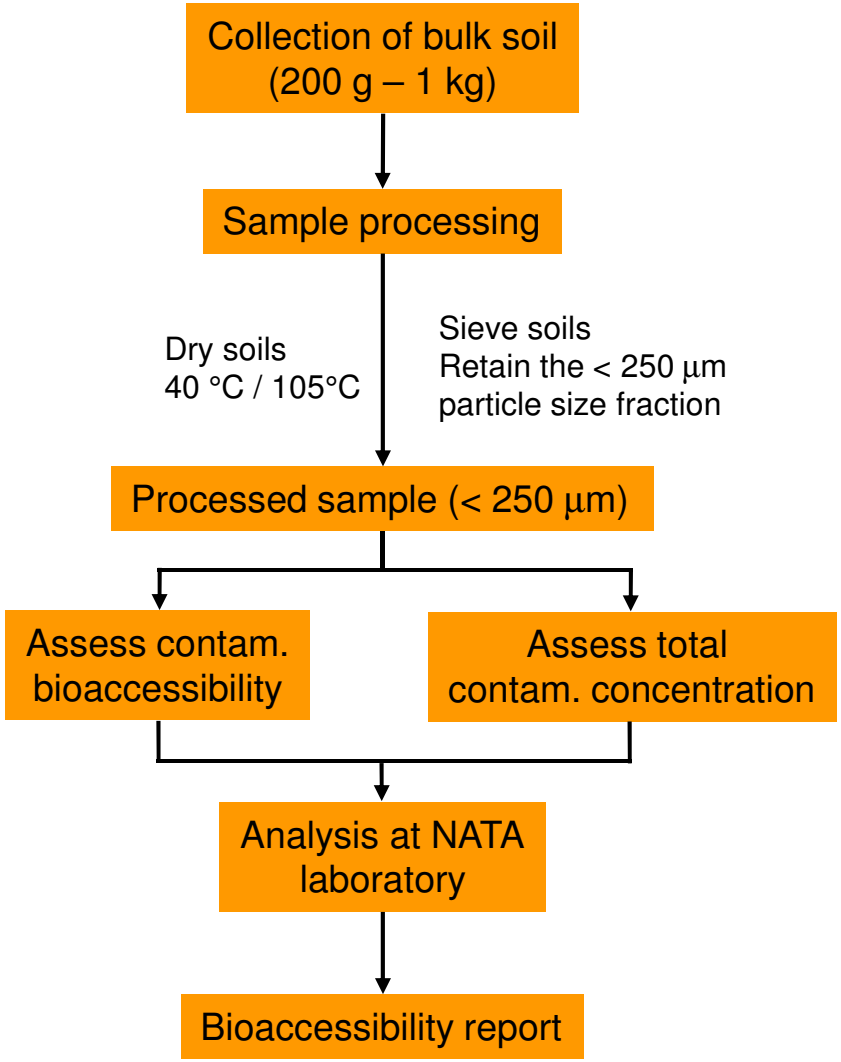
Things to Consider When Assessing Contaminant Bioaccessibility

Arsenic
SBRC gastric phase

Lead
SBRC gastric phase (RBALP) – mine site soils
Rel-SBRC intestinal phase – non mine site soils

Cadmium
PBET intestinal phase
IVG gastric phase

PAHs
Org-PBET + sorption sink



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Application of Bioaccessibility Testing in Site Specific Risk Assessment

Arsenic

Oral pathway (default bioavailability = 100%)

Dermal pathway (default absorption factor = 0.5%)

HILa (pathway contribution)

Ingestion of soil and dust: 86%

Ingestion of home-grown produce: 9%

Dermal absorption: 5%

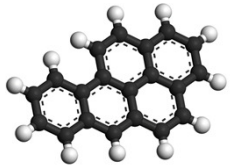
Inhalation of dust: <1%

Default HILa = 100 mg As kg^{-1} (rounded down from 126 mg kg^{-1})

As RBA = 50%

HILa = 219 mg kg^{-1}

Benzo[a]pyrene



Oral pathway (default bioavailability = 100%)

Dermal pathway (default skin absorption = 6%)

HILa (pathway contribution)

Ingestion of soil and dust: 46%

Ingestion of home-grown produce: <1%

Dermal absorption: 54%

Inhalation of dust: <1%

Default HILa = 3 mg BaP_{TEQ} kg^{-1}

BaP_{TEQ} RBA = 10%

HILa = 4.2 mg BaP_{TEQ} kg^{-1}

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Further Information

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