|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PrimarySources** | **SecondarySources** | **TransportMechanisms** | **ExposurePathways** | **Exposed PopulationCharacterisation** |
| ◼ Product Storage (tank, drums, etc.)◼ Piping/Distribution  (manifolds, lines,  pumps, etc.)◼ Operations (wash areas, repair bays,  water treatment,  bending tanks, formulation areas)❑ Waste Management Unit (impound- ments, dry wells,  sludge disposal, etc.)**Legend**❑ Potential◼ Unknown◼ Impacted surficial soils (<0.6m deep)❑ Impacted  Subsurface Soil (>0.6m deep)◼ Dissolved  Groundwater Plume❑ NAPL Plume❑ Impacted surficial soil, sediment, or surface water❑ Wind erosion and Atmospheric  Dispersion❑ Stormwater/ Surface Water Transport❑ Mobile Free- Liquid Migration◼ Volatilisation and  Atmospheric  Dispersion◼ Volatilisation and Enclosed Accumulation◼ Leaching and Groundwater  Transport❑ Soil ingestion/ Absorption ◼ Inhalation◼ Potable Water  Use❑ Recreational Use/Sensitive  Habitat❑ Residential❑ Commercial/ Industrial❑ Construction worker❑ Sensitive ecosystem❑ Other (e.g. playground)◼ Residential◼ Commercial/ Industrial❑ Construction worker❑ Sensitive ecosystem❑ Other (specific)◼ Residential❑ Commercial/ Industrial❑ Construction worker❑ Sensitive ecosystem❑ Other (specific)❑ Recreational❑ Sensitive ecosystem❑ Other (specific) |  |

Figure 2. Example Conceptual Site Model flow diagram (modified from ASTM, 1995)

A conceptual site model can inform the development of and be incorporated into the detailed scope for a human health risk assessment such as is shown in Figure 3. This example deals with the scoping of a risk assessment for hazardous air pollutants (HAP) and persistent, bioaccumulative and toxic pollutants (PBT)

The schema identifies the sources, contaminants of concern (stressors), exposure pathways, potential receptors, and adverse human health effects that the risk assessment will address. The pathways presented are for illustrative purposes only and are not relevant to any specific scenario.

**Figure 3: Example of scoping a risk assessment for air pollutants, indicating pathways considered (bold lines) and pathways no considered. (Adapted from NRC 2008)**

|  |
| --- |
| **Sources**Extrinsic ‘background’ in other mediaIndoor air sourcesExtrinsic ‘background’ in airMobile (on- and off-road)Small ‘area’ sourcesMajorIndustrial |
| **Stressors**Other 155 Clean Air Act HAPS(including PBTs)33 Priority Urban HAPS(including PBTs) |
| Subset of PBTsSubset of PBTs**Pathways/**Indoor airmicroenvironmentsOutdoor air**Media**SoilFoodWater |
| **Routes**DermalIngestionInhalation |
| General Population**Populations**AdolescentsYoung ChildrenAfrican/HispanicIndigenousAdultsAsianCaucasianElderly |
| Estimated percent of population within specified ranges of index values**Endpoints**(Specific non-cancer targetorgan endpoints shown;for example purposes)Cancers (e.g. leukaemia)lung, others)Blood (including marrow & spleen)CNSOther health effectsLiver & kidneyRespiratoryCardiovascular |
| **Metrics****Possible Carcinogens****Cardiovascular Hazard Index**(HAP-specific and cumulative (e.g. by cancer type, weight of evidence, by target organ-specific hazard index) by**Respiratory System Hazard Index****Blood Hazard Index****CNS Hazard Index****Liver and Kidney Hazard Index**Estimated number of cancer casesEstimated percent of population within specified cancer risk rangesDistribution of high-end cancer risk estimates**Known Carcinogens****Probable Carcinogens**State |

Distribution of estimated index values