Subsurface Soil Surveys Public Workshop

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Development of Derived Concentration Guideline Levels (DCGLs or clean-up levels) for Subsurface Residual Radioactivity

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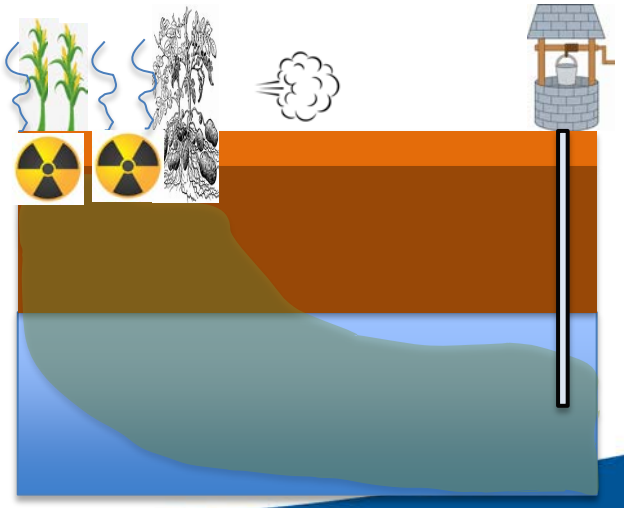
Surface versus Subsurface DCGLs

- What is surface soil?
  - Typically top 6 inches, but
  - Dependent on what can be scanned and
  - Dose modeling assumptions
- Typically, different radionuclides and pathways will dominate dose for surface versus subsurface soils
  - it is important to understand the importance of source parameters such as area, thickness and depth of residual radioactivity to dose through sensitivity analysis

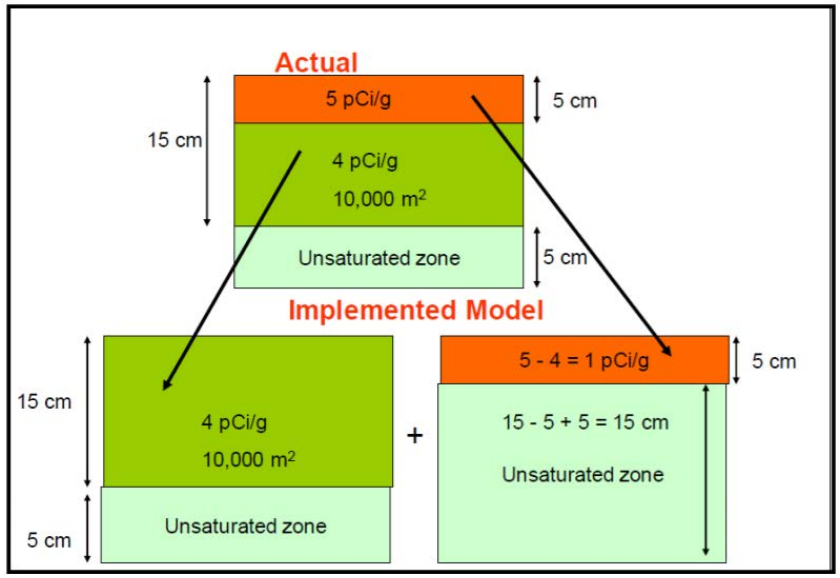
Surface versus Subsurface DCGLs

- Soil Depth (Important Pathways)
  - Surface (external radiation, incidental ingestion, inhalation)
  - Intermediate (plant)
  - Deep subsurface (groundwater dependent pathways)



Multiple DCGLs

- Potential need for multiple DCGLs
  - Vertical heterogeneity and sensitivity of dose results to depth and thickness (i.e., significantly different DCGLs for surface versus subsurface residual radioactivity)
  - Various contaminated media (buildings; surface and subsurface soils; groundwater or surface water; and streambed sediments)



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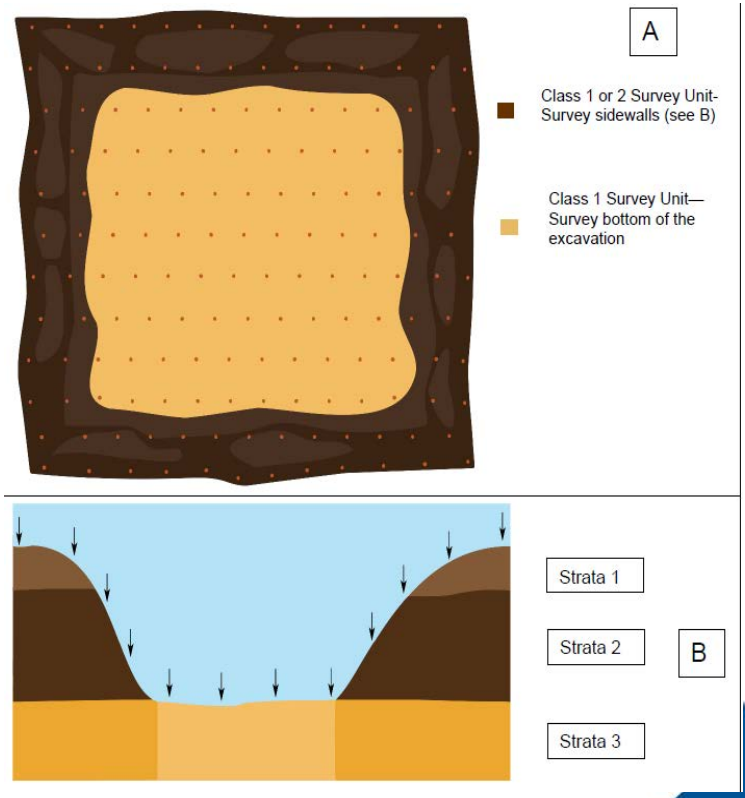
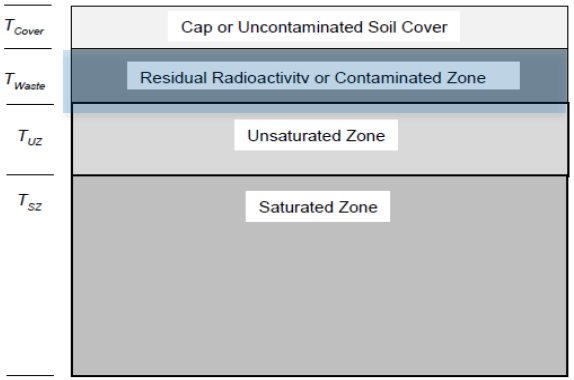
Multiple DCGL Considerations

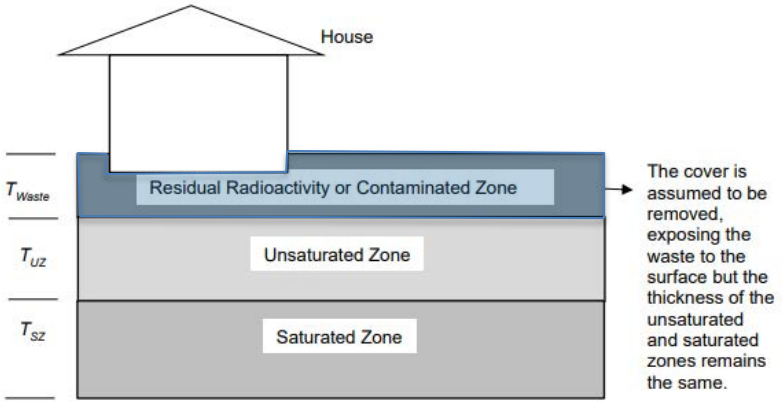
- Challenges associated with applying multiple DCGLs
  - Survey of soils for reuse in an open excavation (when and how to survey)
  - Soil layers are in close contact with each other making accounting of residual radioactivity difficult
- Lack of guidance on conduct of MARSSIM statistical tests for multiple soil layers.
- Potential scenarios that could re-distribute residual radioactivity to the surface should be considered.

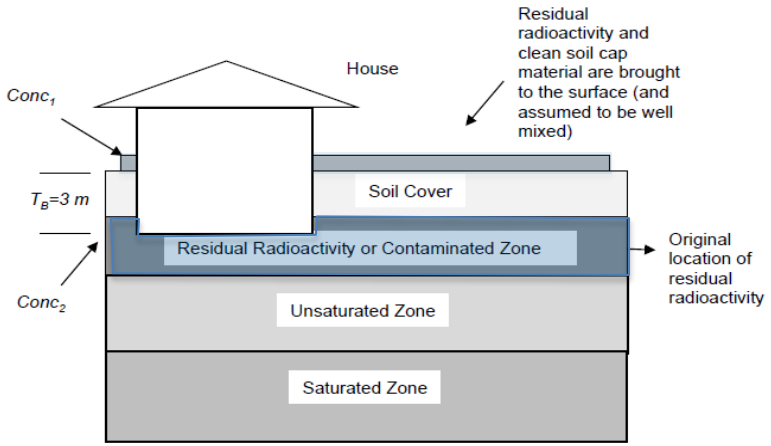


Scenarios for Buried Radioactivity

- Two conceptual models can be considered
  - No soil cover
  - Soil cover

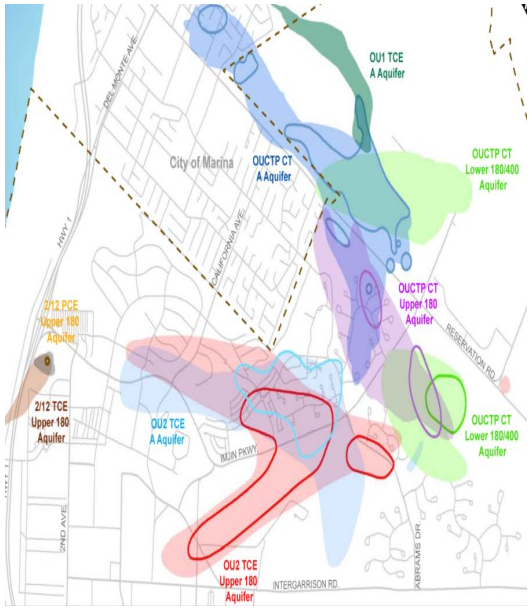






Groundwater Considerations

- In some cases, enough time has elapsed that existing groundwater contamination is present
- The contribution to dose associated with the existing groundwater contamination should be considered
- Biosphere or dose modeling can be used to determine the dose per unit groundwater concentration to determine the contribution of existing groundwater contamination to dose



Thank you!