Appendix C

Site Layout Data Group Details

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Site-specific spatial data information is needed by all modules of the Multimedia Multipathway Simulation Processor, the processor that conducts the risk assessment portion of the FRAMES-HWIR Technology Software System. The basic spatial data input requirements for several of the modules are briefly described below. In each case, the data are passed to and from the models spatially identified by the "j" areas in the relevant spatial data layer. Additional information on site layout data can be found in the document *Documentation of the FRAMES-HWIR Technology Software System, Volume 14: Site Layout Processor.* (See also Section 4.0 of this document.)

- The land application unit and waste pile modules will require site-specific data defining the characteristics of each local watershed i and its j subareas. Spatially derived data inputs will include the number of local watersheds and subareas in each local watershed along with flow length, slope, and area for each local watershed i or subarea j. Average soil and landuse-derived inputs will be the same as those for the regional watershed subbasin in which the local watershed resides.

- The Watershed Module will require site-specific data defining the characteristics of each regional watershed i and its j subbasins. Spatially derived data inputs will include the number of regional watersheds and subbasins in each regional watershed along with flow length, slope, and area for each subbasin. Average soil and land use-derived inputs will be determined for each subbasin j from geographic information system (GIS) soil and land use data.

- The Surface Water Module requires site-specific data defining the number of stream reaches, lakes, or wetlands to be modeled, stream order for each reach j, and the connectivity for all waterbodies. Flow data will be sampled, by stream reach order, from regional data files for the hydrologic region in which the facility resides. Water quality data also will be sampled on a regional basis in a similar fashion, except that stream order will not be considered. The number of local or regional watersheds from which the erosion/runoff loads are coming is data that are required for a waterbody. All the loads from the local or regional watershed will be assumed to impact the waterbody. In other words, the fraction of the local or regional watershed that impacts the waterbody will always be 1.0.

- The Aquifer Module requires site-specific data on groundwater flow direction and receptor well location. Flow direction can be estimated during watershed delineation by assuming that groundwater flows downhill toward waterbodies (i.e., along the local watershed flow path).

- The Air Module will require inputs on the direction and distance to center of angular segments that need to be computed. While this information is not expected to change on a site-by-site basis, allowing the information to be treated as if it were makes it possible to change the area of concern by site if needed in the future.

- The Farm Foodchain Module will require for each medium type (air, groundwater, stream, lakes, and watershed) the number of areas of that type of medium that impacts the farm foodchain area. Also, a fraction of the area that each medium contributes to the concentrations in the farm foodchain is required.

- The Terrestrial Foodchain Module will require for each medium type (air, stream, lakes, and watershed) the number of areas or segments of that medium that impact the terrestrial foodchain area. Also, a fraction of the area that each medium contributes to the concentrations in the terrestrial foodchain area is required.

- The Aquatic Foodchain Module will require for each medium type (stream, lakes, ponds, and wetlands) the number of areas or segments of the medium that impact the aquatic foodchain. Also a fraction of the area or segment that each medium contributes to the concentrations in the aquatic foodchain is required.

- The Human Exposure Module will require for each medium type (air, groundwater, waterbody network, watershed, aquatic, and farm foodchain) the number of areas of that type of medium that impact the farm foodchain area. Also, a fraction of the area that each medium contributes to the concentrations in the farm foodchain is required. Information on the number of households with private drinking water wells is available from the U.S. Census block group data; because the j human receptor areas will be defined by the block group data, this information can be exported as a probability that a household in each human receptor area j has a drinking water well.

- The Ecological Exposure and Risk Module will require for each medium type (air, groundwater, stream, lakes, ponds, wetlands, and watershed) the number of areas of that type of medium that impact the terrestrial and aquatic foodchain areas. Also, a fraction of the area that each medium contributes to the concentrations in the foodchains is required.