

DEVELOPMENT OF MONTANA-SPECIFIC DEFAULT SOIL EXPOSURE FREQUENCIES

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In 2005, as part of the development of the Montana Department of Environmental Quality's (DEQ's) initial Arsenic Action Level in Surface Soil, DEQ conducted an analysis of Montana climate data from the Western Regional Climate Center (www.wrcc.dri.edu) going back to the late 1800s. DEQ determined that there was no location in Montana for which climate data were available that did not have a minimum of four months of an average snow depth of at least 2 inches or an average temperature at or below freezing or both. Therefore, DEQ determined that surface soil and dust exposure (ingestion, dermal, and inhalation) would only be likely to occur during the nine months of the year that did not meet those conditions and that Montana default exposure frequencies would be based upon this information.

For residential surface soil exposure, DEQ calculated that during 75% of the 365 days per year, the soil might be available for exposure. The rounded result was 270 days per year. This is the Montana default residential exposure frequency. The typical residential exposure scenarios include a two week vacation and DEQ's assumption is that those vacation days would occur throughout the year and not all in any one season.

For commercial/industrial exposure, DEQ calculated that during 75% of the 250 working days per year, the soil might be available for exposure. (The 250 working days is based on 52 weeks of work, 5 days per week, and assumes a 10 day vacation.) This results in a Montana default commercial/industrial exposure frequency of 187 days per year.

For construction worker exposure, DEQ assumes that a building excavation might be open for exposure for as long as 4 months and that most land uses include some possibility of this type of construction. Therefore, the Montana default construction worker exposure frequency is 124 days per year. If the reasonably anticipated future use of a property (e.g., an active railroad grade) does not include building construction, an alternate utility worker exposure frequency may be appropriate.

Site-specific exposure frequencies may be appropriate for these typical receptors and should be discussed with DEQ during risk assessment development. Site-specific institutional controls may be required in these cases. Recreational and trespasser exposure frequencies should be site-specific based upon factors such as type of recreation anticipated, site features (e.g., playground equipment or potentially attractive features like ponds or sloughs) security measures in place, and proximity to residential or educational properties. Other exposure parameters (e.g., body weight, skin surface area) are set appropriately based upon the type of receptor and use.