

TITLE: Evaluating Exposure to Ground Water for the Construction Worker and Excavation Activity Receptor Populations

DATE EFFECTIVE: January 2004

HISTORY: Update to VA30009.09.006 - Revision was necessary to reflect changes in the rule citations that became effective in August 2014.

KEYWORDS: Construction/excavation activities, exposure scenario, ground water, direct contact, volatilization

RULE/ AUTHORITY: OAC Rule 3745-300-07 and 3745-300-09

QUESTION: What exposure pathways should be evaluated when assessing exposures to ground water for construction/excavation activities?

ANSWER: Construction/excavation activities as defined in OAC 3745-300-08(C)(2)(d) include invasive activities that may result in potential exposure of adult workers to contact with environmental media for a portion of one year. Exposures during construction or excavation activities are generally of greater intensity and shorter duration than those for residential, or commercial/industrial land uses. The Voluntary Action Program has developed generic direct contact soil standards for construction/excavation activities; see OAC 3745-300-08(C)(3)(d).

Default exposure assumptions as listed in the Support Document for the Development of the Generic Numerical Standards and Risk Assessment Procedures (2014) include the following:

Exposure Duration	1.0 year
Exposure Frequency	120 days/year
Exposure Time	8 hours/day
Skin surface area exposed to soil	3300 cm

The point of compliance for VAP applicable standards for construction/excavation activities is from the ground surface to the maximum depth in which the activity is reasonably anticipated to occur, which may include exposures to ground water.

Because there are no applicable generic standards for direct contact with ground water for construction/excavation activities, standards

must be derived through a property specific risk assessment in accordance with OAC 3745-300-09. For a reasonably anticipated complete exposure pathway to ground water from construction or excavation activities, exposure routes of interest include inhalation and dermal contact. Incidental ingestion of ground water is considered to be sporadic, difficult to quantify, and of secondary importance when compared to dermal contact and inhalation. Therefore, it is not necessary to quantify exposure via ingestion of ground water when evaluating risks to the construction/excavation worker. The exposure assumptions listed above would apply to the development of an applicable standard for complete exposure pathways to ground water during construction/excavation activities, unless property-specific information allows the use of alternate exposure scenarios.

The method for evaluating the inhalation pathway for ground water exposures is dependent on the reasonably anticipated construction/excavation activity and property specific characteristics. For example, intake via inhalation may vary depending on the presence or absence of trenching or dewatering activities, depth to ground water, and the type and concentration of COCs in the ground water. Contact an Ohio EPA VAP representative for appropriate methods and models to evaluate inhalation exposures for site specific scenarios.

Dermal exposures can be modeled, with construction/excavation exposure assumptions, using the algorithm for dermal intakes in the development of the generic unrestricted potable use standards. Please see Equations 21 and 24 in the *“Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures, 2014”* for more information. For chemical- specific permeability coefficients, please see *“Dermal Exposure Assessment: Principles and Applications, Interim Report”*. Office of Research and Development. U.S. EPA, January 1992 EPA/600/8- 91/011B, or contact an Ohio EPA VAP representative.

SUMMARY:

Appropriate exposure pathways for developing an applicable standard for ground water exposures during construction/excavation activities include dermal contact and inhalation. Ingestion of ground water is considered incidental and is not included in the exposure pathway. Contact an Ohio EPA VAP representative for guidance on assessing inhalation exposures to ground water.

OHIO EPA CONTACT:

For any questions concerning this issue, please contact the VAP central office at (614) 644-2924.