

ARCHIVE: Archived because revisions made to VAP rules in 2002 in OAC Chapter 3745-300 necessitate revisions to this guidance. However, this document is accurate under the 1996 VAP rules. Refer to VA30008.03.001 for the updated document.

OHIO EPA

DIVISION OF EMERGENCY AND REMEDIAL RESPONSE VOLUNTARY ACTION PROGRAM

FREQUENTLY ASKED QUESTION #7: Appropriate Use of Multiple Chemical Adjustment for Risk-Derived Potable Use Standards

PURPOSE

This series of fact sheets is intended to provide guidance regarding the Agency's position concerning the interpretation of certain Voluntary Action Program (VAP) rule requirements. The information provided within these documents is based upon Agency evaluation of several VAP no further action letters submitted with the intent of obtaining a covenant not to sue as well as assistance provided for several VAP technical assistance projects.

QUESTION

How are risk-derived unrestricted potable use standards (RDUPUS) determined for the purpose of demonstrating protection of ground water meeting unrestricted potable use standards (POGWMUPUS)?

BACKGROUND

When determining whether or not the requirements under Ohio Administrative Code (OAC) 3745-300-10(E) (the POGWMUPUS provisions) apply to a property, the volunteer must compare the ground water chemical of concern (COC) concentrations to the generic unrestricted potable use standards (GUPUS) or, if no GUPUS exists, (*i.e.* no standard for a specific COC is contained in Table VII of OAC

3745.300-08, the VAP Generic Numerical Standards Rule) the volunteer must compare the COC concentration(s) to standards derived in accordance with OAC 3745-300-09, the Property-Specific Risk Assessment Rule, also known as risk-derived unrestricted potable use standards or RDUPUS. (Risk-derived standards are developed utilizing the assumptions for the **residential potable ground water use scenario** contained in the VAP guidance document, “**Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures**”). For most of the VAP standards, conducting a multiple chemical adjustment to account for cumulative risk posed by multiple chemicals to a receptor population is appropriate; however, a multiple chemical adjustment of the generic ground water standards (GUPUS) is not appropriate since the majority of these standards are derived considering factors other than, or in addition to, risk factors. A multiple chemical adjustment of RDUPUS is technically appropriate since these standards are wholly risk-derived and do not consider other factors such as economic feasibility, technical feasibility, *et cetera*. The question then arises regarding when the multiple chemical adjustment must be performed to the RDUPUS values when calculating the unrestricted potable use standards for purposes of determining if the provisions for POGWMUPUS apply.

ANSWER

A multiple chemical adjustment of *generic unrestricted potable use standards* (GUPUS) should **not be** performed when determining if the provisions for POGWMUPUS apply. Therefore, volunteers and certified professionals should compare the standards that are found in Table VII of OAC 3745-300-08 to the concentrations of ground water COCs to determine if the POGWMUPUS provisions apply.

A multiple chemical adjustment to account for the cumulative risk of multiple chemicals to a receptor population **should be** conducted to determine applicable standards whenever *risk-derived unrestricted potable use standards* (RDUPUS) are derived for multiple COCs (*i.e.* when no GUPUS values exist for two or more of the COCs). The values derived by the appropriate multiple chemical adjustment of the RDUPUS to account for cumulative risk are the applicable standards that must be complied with when concentrations of COCs in identified areas are determined at the point(s) of compliance in a ground water zone in accordance with OAC 3745-300-07 (D)(5)(d). If it is determined that the provisions for POGWMUPUS apply, the volunteer is then obligated to prevent the COCs in the unsaturated zone from leaching to ground water at concentrations in excess of the cumulatively-adjusted RDUPUS values.

EXAMPLE

At a property undergoing voluntary action, let us assume that eight contaminants are detected in ground water. These are benzene, toluene, ethyl benzene, vinyl chloride, TCE, isopropyl benzene, silver, and 1,1-dichloroethane. The question that arises is: what are the applicable standards for these contaminants in ground water for the purposes of protection of ground water requirements in the VAP rules ? Once these applicable standards have been identified, the comparison of site ground water concentrations to these applicable standards will dictate whether the protection of ground water provisions apply or whether the ground water has to be classified appropriately and the appropriate response requirements of that classification satisfied.

Of these eight contaminants, five of these, namely benzene, toluene, ethyl benzene, vinyl chloride, and TCE have generic unrestricted potable use standards as found in OAC Rule 3745-300-08. The other three contaminants do not have a generic standard. Hence, a risk derived unrestricted potable use standard should be derived for these three contaminants using the procedure described in OAC Rule 3745-300-09. To summarize, the applicable potable use standards for these eight contaminants could be as follows (RDUPUS for the last three COCs have been assumed for this example):

Contaminant	Generic Unrestricted Potable Use Standard (ppb)	Single Chemical Risk-Derived Unrestricted Potable Use Standard (ppb)
Benzene	5	
Toluene	1000	
Ethyl benzene	700	
Vinyl Chloride	2	
TCE	5	
Isopropyl benzene		1200
Silver		78
1,1-Dichloroethane		1500

To determine the applicable standards in ground water for the three contaminants with risk-derived unrestricted potable use standards, their single-chemical standards should be adjusted for cumulative risk due to the presence of multiple chemicals. This adjustment should be done in accordance with the risk criteria described in paragraph (C) of OAC Rule 3745-300-09. This can be accomplished by adjusting the single chemical risk-derived unrestricted potable use standard in a manner analogous to the procedure described for direct contact soil standards in paragraph (B)(2)(b) of OAC Rule 3745-300-08 (an example worksheet for multiple chemical adjustment is available from the Voluntary Action Program on request). Let us assume that the risk-derived unrestricted potable use standards for Isopropyl benzene, silver, and 1,1-Dichloroethane after multiple chemical adjustment are 400, 26, and 500 ppb respectively. Thus, the applicable standards for ground water for the protection of ground water requirements are as follows:

Contaminant	Generic Unrestricted Potable Use Standard (ppb)	Cumulatively Adjusted Risk-Derived Unrestricted Potable Use Standard (ppb)	Applicable GW Standard for Protection of GW (ppb)
Benzene	5		5
Toluene	1000		1000
Ethyl benzene	700		700
Vinyl Chloride	2		2
TCE	5		5
Isopropyl benzene		400	400
Silver		26	26
1,1-Dichloroethane		500	500

Hence, if the concentration of contaminants on the property as determined by the procedures described in paragraph (D)(3)(d) of OAC Rule 3745-300-07 exceed the applicable GW standards for protection of ground water criteria, then the ground water is considered impacted and the POGWMUPUS requirements do not apply. In such an instance, the ground water should be classified in accordance with the requirements of OAC Rule 3745-300-10. If the concentration of these contaminants is less than these applicable standards, then the POGWMUPUS requirements would apply and a POGWMUPUS demonstration should protect the ground water at these standards.