Title 10 – DEPARMENT OF NATURAL RESOURCES
Division 20 – Clean Water Commission
Chapter 10 – Underground Storage Tanks – Technical Regulations

PROPOSED RULE

PURPOSE: This rule sets forth the procedures and requirements for developing risk-based target levels at petroleum storage tank release sites.

10 CSR 20-10.077 Risk-Based Target Levels

(1) Risk-based target levels shall be determined for chemicals of concern in accordance with the requirements of this rule.

(2) Definitions. The following definitions apply to terms used in this rule.

(A) "Cancer slope factor" means an upper bound estimate, approximating a 95% confidence limit, of the increased cancer risk from a lifetime exposure to a chemical expressed in units of proportion per unit dose (mg/kg-day).

(B) "Hazard quotient" means the ratio of an exposure level to a chemical to the reference dose for that chemical.

(C) "Individual excess lifetime cancer risk" means the increase over background in an individual's probability of developing cancer over a lifetime due to exposure to a chemical.

(D) "Inhalation unit risk" means the increase in the lifetime risk of an individual who is exposed for a lifetime to one (1) microgram per cubic meter ($\mu g/m^3$) of a chemical in air.

(E) "Reference concentration" means an estimate, with uncertainty spanning perhaps an order of magnitude, of a continuous inhalation exposure to the human population, including sensitive subgroups, that is likely to be without an appreciable risk of deleterious effects during a lifetime.

(F) "Reference dose" means an estimate, with uncertainty spanning perhaps an order of magnitude, of a daily oral exposure to the human population, including sensitive subgroups, that is likely to be without an appreciable risk of deleterious effects during a lifetime.

(3) Determination of risk-based target levels shall be consistent with the risk assessment tier being evaluated under 10 CSR 20-10.078 and may include:

(A) Default target levels that are the lowest of the tier one risk-based target levels for groundwater and soil type one soils;

(B) Tier 1 risk-based target levels;

(C) Tier 2 site-specific target levels; or

(D) Tier 3 site-specific target levels.

(4) Target risk level. Risk-based target levels shall be calculated for chemicals of concern using the following target risk levels.

(A) For chemicals of concern that are carcinogenic, the target risk level for each chemical of concern and route of exposure shall be an individual excess lifetime cancer risk of one in one hundred thousand ($1x10^{-5}$).

(B) For chemicals of concern that are non-carcinogenic, the target risk level for each chemical of concern and route of exposure shall be a hazard quotient of one (1).

(C) Additive risk due to multiple chemicals and multiple routes of exposure is not considered.

(5) Toxicity factors. Risk-based target levels shall be determined for chemicals of concern using the most recent values for the cancer slope factor, inhalation unit risk, reference dose or reference concentration recommended by the United States Environmental Protection Agency or other values determined by the department, except as provided in 10 CSR 20-10.077(11).

(A) Dermal toxicity values shall be determined using a methodology approved by the department.

(6) Physical and chemical properties. Risk-based target levels shall be determined for chemicals of concern using values for physical and chemical properties established by the department, except as provided in 10 CSR 20-10.077(11).

(7) Exposure factors. Risk-based target levels shall be determined for chemicals of concern using values for exposure factors specific to a receptor and exposure pathway established by the department, except as provided in 10 CSR 20-10.077(11).

(8) Mathematical models. Risk-based target levels shall be determined for chemicals of concern using models for determining uptake and transport and fate established by the department, except as provided in 10 CSR 20-10.077(11).

(9) Tier one risk-based target levels. Risk-based target levels for a tier one risk assessment shall be determined by the department using models and default values established by the department.

(10) Tier two site-specific target levels. The remediating party shall determine tier two site-specific target levels using models and equations established by the department and representative values for fate and transport parameters appropriate to the site derived from site-specific data and information.

(A) The values for fate and transport parameters shall be technically defensible and justifiable as representative of the site.

(B) The remediating party shall use the dilution-attenuation factor values for the vadose zone based on depth to groundwater at the site listed in Table 1 to account for reduction in concentration during leaching through the vadose zone.

(C) Lead. The remediating party shall not determine tier two site-specific target levels for lead and the tier one risk-based target levels shall be used. Site-specific target

levels for lead may be determined by the remediating party as part of a tier three risk assessment if appropriate.

(11) Tier three target levels. The remediating party shall determine tier three site-specific target levels using values for fate and transport parameters appropriate to the site derived from site-specific data and information.

(A) The values for fate and transport parameters shall be technically defensible and justifiable as appropriate for the site, exposure pathways being evaluated and models being employed.

(B) The remediating party may use an alternative value or values for toxicity factors, physical and chemical properties, and exposure factors if the value can be adequately justified by the responsible party and is approved by the department.

(C) The remediating party may use an alternative model or models to evaluate transport and fate of chemicals of concern and exposure pathways if the model can be adequately justified by the responsible party and is approved by the department.

(D) Lead. The remediating party may determine tier three site-specific target levels for lead using an appropriate model approved by the department.

Table 1 – Dilution-attenuation factors for vadose zone transport.

Depth to groundwater	Dilution-attenuation factor
Less than 20 feet	1
20 – 50 feet	2
Greater than 50 feet	4