



Standard Guide for Application of Engineering Controls to Facilitate Use or Redevelopment of Chemical-Affected Properties¹

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INTRODUCTION

Environmental media, such as soil, groundwater, or air, are susceptible to impact by chemical releases associated with past property-use activities; or they may be affected by naturally occurring conditions. Previously developed properties may have been impacted by chemical releases associated with historical operations, chemical spill incidents, waste management practices, or other related sources of COCs. In some cases, such chemicals may remain in soil, groundwater, or other environmental media; and, depending on their toxicity, concentration, location, and migration potential in the environment, they can pose a potential health risk in the event of exposure of current or future property users. Similarly, in the absence of a chemical release caused by human activity, COCs that are naturally present in soils, groundwater, soil vapors, or other environmental media can pose an unacceptable risk to human health, depending on the chemical toxicity and exposure (e.g., radon gas emanation into indoor air space of overlying buildings). Under certain conditions, in the absence of exposure controls, human exposure to chemical-affected environmental media at residential, commercial, or industrial properties could occur via various exposure pathways, including but not limited to (1) surface soil direct contact, (2) ambient or indoor air vapor exposure, or (3) affected groundwater impact on subsurface structures or utilities. Other pathways or exposure mechanisms may exist, and if so, should be addressed in a similar manner to those addressed in the guide.

1. Scope

1.1 This guide presents general considerations for application of engineering controls to facilitate continued use or redevelopment of properties containing chemical-affected soil, groundwater, or other environmental media, due either to chemical releases or naturally-occurring conditions. This guide is not meant to be prescriptive but rather to present considerations for evaluating technologies capable of addressing potential human exposures associated with chemical-affected environmental media.

1.2 **Table 1** lists the considerations that should be taken into account when developing an engineering control in accordance with this guide.

1.3 This guide is intended for use by real estate developers, civil/structural designers, environmental regulators, industrial

parties, environmental consultants, and other persons concerned with residential, commercial, or industrial development of real properties where chemical-affected environmental media are present. The design process should involve the individuals and firms working on various aspects of the specifications for construction, operation, and maintenance. If the site is located on public property, then public participation should be considered during the design process.

1.4 This guide is directed toward properties where chemical-affected environmental media, associated with either human-influenced activities or naturally-occurring conditions, will remain in place and where active or passive engineering controls will be used to reduce or eliminate exposures that may otherwise pose an unacceptable risk to property users.

1.5 This guide identifies the exposure concerns associated with chemical-affected properties that may affect the property development plan, both in the construction phase and during the proposed use of the property; defines performance standards for control of applicable exposure pathways; and, for each exposure pathway, provides examples of engineering controls that may be applied for new or existing construction.

¹ This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.04 on Corrective Action.

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