
APPENDIX 14

European oil industry guideline for risk-based assessment of contaminated sites

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ABSTRACT

This report proposes a three-tiered approach to assessing the condition and corrective action requirements for oil industry sites ranging from complex refineries down to retail service stations. The nature and extent of contamination at such sites can range from major to insignificant. The potential for soil and groundwater contamination to expose a neighbour, an on-site worker, or another potential receptor also varies enormously.

This approach uses the principles of risk-based corrective action (RBCA) which follows a flexible approach to decision making whereby corrective action is appropriately tailored to site-specific conditions and hazards. This leads to more cost-effective solutions, and allows the greatest effort to be targeted to where it is most beneficial.

The underlying concepts of Risk-Based Corrective Action are described in this report. Work is still continuing on developing specific guidance on the details of the methods to be used.

KEYWORDS

Clean-up, contaminated sites, contamination, corrective action, oil, oil industry, petroleum, RBCA, refineries, risk, risk based corrective action, screening, terminals, toxicity.

NOTE

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SUMMARY

Industry, regulatory and public attention to contaminated land in Europe has escalated dramatically over recent years. Faced with a variety of local and national approaches to this problem, a process has been developed to assist the European oil industry in assessing the condition and corrective action requirements for sites ranging from complex refineries down to retail service stations. The nature and extent of contamination at such sites can range from major to insignificant. The potential for soil and groundwater contamination to expose a neighbour, an on-site worker, or another potential receptor also varies enormously.

Some countries have set fixed numerical criteria to decide these issues based on generic assumptions on site conditions such as; soil type, depth to groundwater, geology and hydrogeology, and proximity to potential receptors (e.g. groundwater supply well, basement, surface water body). Such an approach ignores the fact that contaminated sites vary widely in terms of both complexity and the potential risk they may pose to either human health or the environment. As fixed numerical criteria are nearly always set at very low levels, their use leads to the clean-up of more land than may be necessary. The result is wastage of resources (and ultimately added expense to the consumer) with clean-up costs incurred without an incremental reduction in risk to human health and the environment.

In recent years, the principles of risk-based corrective action (RBCA) have been applied. This follows a flexible approach to decision making whereby corrective action is appropriately tailored to site-specific conditions and hazards. This leads to more cost-effective solutions, and allows the greatest effort to be targeted to where it is most beneficial. In its broadest sense, risk assessment in relation to contaminated land can be defined as "an evaluation of whether there is a potential for adverse effects to occur, based on factual knowledge about a site, and scientific evidence concerning the environmental behaviour and toxicity of the chemicals present".

Although this method is applied in the USA (ASTM RBCA), there are a number of differences between the USA and Europe. CONCAWE therefore decided to develop similar techniques for Europe and produce a Guideline which sets out an approach which could be adapted to the situations prevailing in the various European countries.

The underlying concepts of Risk-Based Corrective Action are described in this report. Work is still continuing on developing specific guidance on the details of the methods to be used. This will be published at a later date.

The CONCAWE Guideline recommends a three tiered approach to corrective action decision making. It assumes that one starts with relatively little site data, and therefore uses conservative generic assumptions. By conducting additional investigation and analysis, more site-specific knowledge is used in developing subsequent clean-up targets. The result is fully protective of human health and the environment throughout Tiers 1, 2 and 3.

The three tiered approach is based on the principle of source-pathway-target. It starts with an initial assessment of the site which involves gathering general data including potential sources of contaminants, obvious evidence of contamination,