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test concept for advanced oxidation techniques

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Treatability studies: Test concept for advanced oxidation techniques

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The fundamental information that a well-designed treatability study can provide is essential to the success of all remediation systems. Over the past years several new techniques for *in situ* and on site remediation of contaminated soil and groundwater have been used with varying degrees of success. Based on the wide selection of different techniques several screening matrices have been developed in order to make it easier to choose the best suited technique for a given situation. However, these matrices only provide an indication of which technology that might be effective and often the assessor ends up with 3 or 4 applicable techniques.

In stead of selecting a full scale technique solely based on information collated during a literature research it is best practice to supplement the remediation screening phase with laboratory and *in situ* pilot treatability tests. As well as establishing the applicability of the proposed technique, the treatability tests also provide essential site-specific design parameters required for the full scale system, namely; oxidant demand, delivery method, and kinetics etc.

Drawing up field studies and laboratory data, this paper will discus the importance of conducting screening laboratory and pilot test prior starting up the full scale treatment of a contaminated site with a given technology. For this purpose Rambøll has developed a mobile test unit including equipment for both standard and more advanced oxidation test directly on the site. The remediation techniques included are electrochemical oxidation, photochemical/photocatalytic oxidation, ozone, Fenton's, permanganate, and persulfate among others. A versatile construction of the test unit makes it possible to combine different techniques in order to obtain more aggressive and effective remediation technologies, e.g. UV/ozone or electrochemical/H_2O_2. Actual case study data is presented to illustrate the benefits of in situ treatability tests prior to full scale implementation of the preferred remedial technology.

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