

The value of dynamic remediation processes: a real option approach

Compernelle T., Hasselt University

Van Passel, S., Hasselt University

Lebbe, L., Ghent University

Huisman, K., Tilburg University

Kort, P.M., Tilburg University

Thewys, T., Hasselt University

Keywords: Nonlinear Dynamical systems, Resources and environment

Restricted by limited resources, the management of problems related to soil and groundwater contamination involves the search for a balance between costs and benefits, integrating the knowledge from multiple disciplines. A wide range of economic decision tools are available to support the remediation selection process, including Cost Benefit Analysis (CBA), risk-based CBA, and multi-criteria analysis. However, these tools do not take into account the reversibility of a remediation strategy. Aim of this study is to examine the value of a bioremediation project embedding the option to redirect the remediation process once it is proved that the investment would not be economically feasible. A dynamic decision model is developed to determine the critical level of 'bad' groundwater samples at which the remediation process should be redirected. This model is then applied on a fictive case study in which a firm faces the decision to continue a bioremediation strategy or to redirect the remediation process. It is shown that when remediation strategies are considered as dynamic processes, the value of remediating contaminated soil and groundwater increases.