

Bioremediation Field Trials

Description

During Stage 3 Orica engaged GeoSyntec Consultants Inc. (a specialist Canadian consultancy) to conduct laboratory scale microcosm studies of bioremediation options for Orica Southlands soil and groundwater. The results of the studies were very promising and prompted GeoSyntec to recommend field scale trials, which would involve the addition of soluble and sparingly soluble nutrients into the shallow and deep aquifers to enhance the activity of the indigenous microbial consortia. The proposed nutrients include methanol, emulsified edible vegetable oil and calcium oleate. They would be applied actively (pumped) and passively (slug injected) into selected sections of the shallow and deep groundwater that are affected by EDC (ethylene dichloride, 1,2-dichloroethane). The trials are expected to take around 18 months following approval to proceed.

Objectives

- To assess the ability of the indigenous microbial consortia to degrade EDC in the field
- To assess the effectiveness of different nutrients in enhancing biodegradation
- To review any other impacts of nutrient addition
- To determine the feasibility of scaling up to full scale implementation
- To obtain data for designing full scale implementation in shallow and deep aquifers

Technology

Bioenhancement uses nutrients – or electron donors – to promote biological degradation of targeted compounds in the groundwater.

Resources

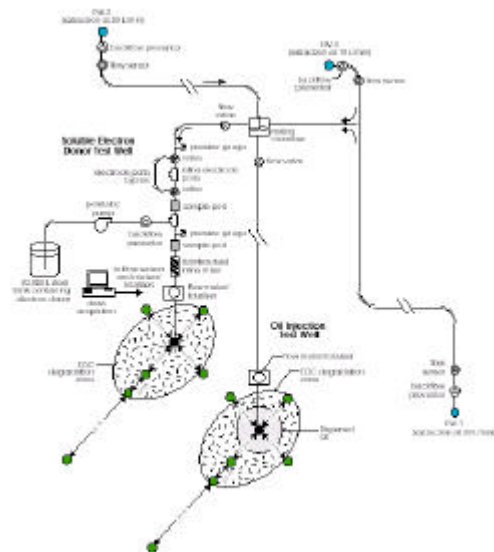
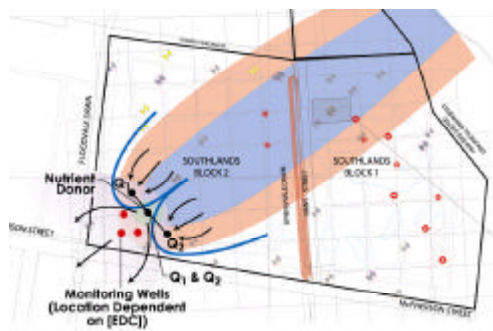
Project management: Orica
Consulting – bioremediation: GeoSyntec Consultants Inc.
Consulting – hydrogeology: URS Australia

Measures

- Decreasing downgradient concentrations of EDC; increasing degradation products
- As-expected distribution of nutrients into the aquifers
- Consumption of nutrients
- No adverse impacts on aquifers
- Sufficient data for full scale design and costing

Timing

Completion by end December 2003.



Draft conceptual designs for bioremediation of the deep aquifer beneath Block 2 Southlands