

## **GROUNDWATER MODELING SERVICES FOR IN-SITU REMEDIATION**

Environmental Bio-Systems, Inc. (EBS) is offering the technique of groundwater flow and transport modeling for in-situ remediation. The developed model is used to evaluate the effectiveness and expected remediation time frame of enhanced bioremediation such as using gas infusion with a tool like the iSOC or other remedial technologies including ozone injection and chemical oxidizer injections (Fenton's Chemistry, hydrogen peroxide, potassium permanganate, persulfate or others).

- Cost Effective
- Maps and report useful for Corrective Action Plans and Remedial Action Plans
- Predict radius of influence
- Generally predict duration of remediation (+/-)
- Compare various technologies:
  - Enhanced bioremediation (iSOC), ozone, Fenton's Chemistry, etc.
  - Develop spacing of injection or delivery ports/wells
- Performed by a team with expertise in modeling and in-situ remediation

For sites with relatively homogeneous or stratified lithologies in subsurface, use of a two-dimensional (2-D) model often is representative and sufficient. The 2-D modeling would use software such as FLOWPATH. For more complex sites, a three-dimensional (3-D) modeling using software such as MODFLOW would be more appropriate. Service fee for modeling includes review of site data, development of a conceptual and an executable computer models, calibration and application of the site-specific model, interpretation of the modeling results, and preparation of a modeling report that present the effectiveness and anticipated value of the modeled remedial technologies.

## **EXPERIENCE**

Modeling would be performed and guided by Jim Ho, Ph.D., P.E., CGWP, Principal Engineer. Dr. Ho has 25 years of experience and is an expert modeler. Jim Jacobs, P.G., C.H.G. will review remediation options. Mr. Jacobs has 25 years of experience and specializes in in-situ remediation.

## **COSTS:**

2-D modeling:	\$2,900
3-D modeling :	\$3,900

Please call Jim Jacobs at 415-381-5195 about project details.