ENVIRONMENTAL BUSINESS COMMITTEE
WHITE PAPER

OBSERVATIONAL METHODS FOR HAZARDOUS WASTE SITE REMEDIATION

The EBC recognizes that the high potential risks of hazardous waste sites and the high cost of remediation demand extraordinary precision and accuracy in the remedial work performed. However, EBC also recognizes that the complex and highly variable nature of hazardous waste sites present enormous challenges to our current technologies. The technical challenge is to implement effective environmental remedies while recognizing the inherent uncertainties of site assessment and remediation, which include:

- Characterizing the nature and extent of contamination,
- Characterizing the subsurface environment,
- Assessing the fate and transport of chemicals, and risks to human health and the environment, and
- Applying the limited knowledge of remediation technologies.

Hazardous waste site remediation must be conducted in a way that protects the public health and the environment yet acknowledges that uncertainties regarding these sites will continue to exist.

Given these conditions, EBC endorses the **observational method**, developed for soils and foundation engineering by Karl Terzaghi, R.B. Peck, and others, as the appropriate method for hazardous waste site investigation, assessment, remediation design and implementation.

The key contributions of this method are the following:

- The site remediation design is based on the most probable site condition,
- Reasonable deviation from these conditions are formally identified and accounted for,
- Parameters are identified for further observation in order to detect deviations,
- Contingency plans for each deviation are incorporated into the remediation design, and
- Post-remedial monitoring is established as an essential component of hazardous waste site remediation.

Adopting the observational method for hazardous waste remediation will better prepare the scientists, engineers, policy makers and the public involved in decision-making to deal realistically with the technical uncertainties characteristic of hazardous waste sites.