



Inter-group joint research achievement: development of a high precision technique for surveying and evaluating soil contaminated with oil

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[Outline]

To reduce environmental pollution risks and cut survey and remediation costs, the Exploration Geophysics Research Group and the Geo-Analysis Research Group developed a risk assessment technique that combines high precision exploration geophysics survey methods with chemical analysis methods. The new technique is now being used at oil contamination sites.

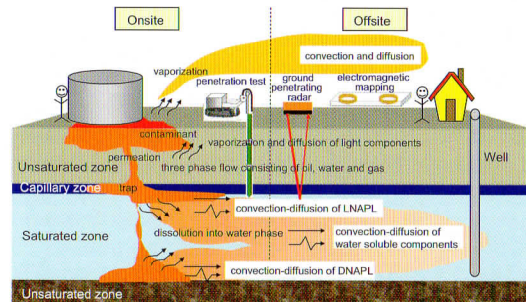
[Details]

The development of geo-environmental risk assessment techniques is a major goal of the Institute's medium term plan. This research focuses on 3D modeling of the subsurface environment, the development of high precision exploration geophysics and chemical analysis methods for surveying and assessing oil-contaminated soils, and the combination of these methods to develop risk assessment methods. So far, we have developed a new risk assessment technique that enables multiphase flow analysis, and which can be applied to both unsaturated soil layers near the surface and saturated groundwater layers. We have also developed techniques that combine chemical analysis with exploration geophysics techniques using electromagnetic waves and resistivity that can be applied in the field to sites contaminated with mineral oils (petroleum, diesel, fuel oil, etc.).

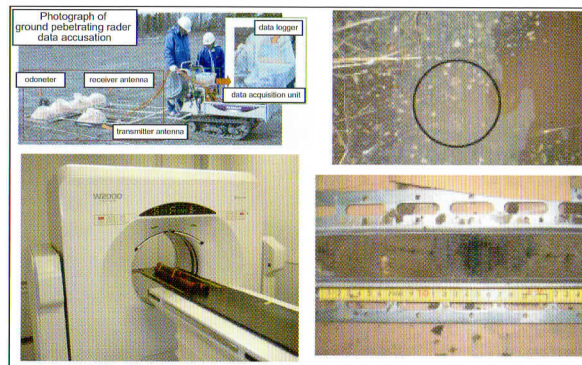
[Applications]

The high precision exploration geophysics technique and geo-environmental risk assessment system will likely be used in such applications as:

- (1) Assessment of sites for businesses and factories
- (2) Reduction of the cost of surveying and remediating contaminated sites
- (3) Application of risk assessment methods to bioremediation technology



Schematic illustration of soil contamination due to mineral oil.
Application of exploration geophysics techniques to assess contamination risks.



Application of exploration geophysics and chemical analysis techniques.
(top left) Use of ground penetrating radar to obtain data. (bottom left) CT scan of a core sample. (top right) Oil film coating a puddle at a site. (bottom right) Oil residues (blackish area) in a core sample.