# UNIVERSITY OF PARMA

**INTERNATIONAL UNIVERSITY MASTER (II LEVEL): *SCIENCE AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT OF CONTAMINATED SITES.* ACADEMIC YEAR 2002/2003.**

# SITE INVESTIGATION PHASE 1, 2 AND 3: WORK EXPERIENCE IN GROUND SOLUTIONS GROUP, ASHFORD (UK)

Master student: ***Laura Polazzi***

## Abstract

The thesis reports the activities carried out by Laura Polazzi during a work experience in Ground Solutions Group as part of her MSc on contaminated land at the University of Parma.

The first part is a theoretical description of the English approach to the matter of contaminated land. The second part is a description of Phase 1, 2 and 3 contaminated land projects.

Ground Solutions Group (GSG) is a company committed to the provision of environmental and geotechnical services. The office is located in Ashford, Kent (United Kingdom).

The activities include: Environmental Monitoring, Remediation Design, Ecological Services, Risk Assessment, Laboratory Soil Testing, In-situ Testing of Soils, Geotechnical consultancy, Ground Investigation, Landfill Gas Monitoring, Contaminated Land Investigations, etc.

Contaminated land is one of the legacies of past and present industrialization and waste disposal activity. Increased environmental awareness and concerns regarding the environmental impact of this contamination has resulted in the need either to remove the contaminating materials or to tender them harmless.

The English Government is encouraging the beneficial re-use of previously-developed land, and more specifically the remediation of land affected by contamination. The intention is to relieve the pressure on greenfield sites and preserve the countryside. To encourage this, various grants are available. Under certain circumstances, where remediation takes place voluntarily, the disposal of contaminated soil to licensed landfill may be exempt from landfill tax.

The main steps of the site investigation carried out are as follows: Desk study, Site reconnaissance, Ground investigation, Laboratory testing, Final report.

*Desk study*: the desk study is work taken up prior to commencing the work on site and the Ground Investigation. It should always be the first stage of the Site Investigation and is used to plan the Ground Investigation. The work involves researching the site to gain as much information as possible, both geological and historical. These allow much information to be obtained such as former uses of the site; concealed mine workings; infilled ponds; old clay, gravel and sand pits; disused quarries; changes in topography and drainage; changes in stream and river courses; coastal erosion; changes in potential landslide areas. Geological Maps and memoirs are probably the most important source of information as these give an excellent indication of the sort of ground conditions likely to be encountered. Services records are also an essential part of the desk study, necessary to locate hidden services such as electricity cables, sewers and telephone wires.

*Site Reconnaissance*: a walk over survey of the site. Important evidence to look for is: Hydrogeology, Slope instability, Mining, Access.

*Ground investigation*: is taken to be that other than the information available from the walk over survey. There are three principal methods of investigating the ground conditions, trial pits, boreholes and window samples.

*Sampling:* can be either undisturbed, of which in-situ testing is a form, or disturbed. The principal sampling methods used are: D-sample, SPT test, U100, Bulk Samples, Water Samples.

*Reporting*: Included in the report should be a location of all the boreholes, trial pits, other excavations and their logs. These logs should give as much information as possible on the soil and rock structure as it is possible to obtain.

The projects carried out during the work experience in GSG and described in this report include:

- Supervision of a large Environmental Investigation of a distribution depot in Droitwich, Worcestershire, where a spill of diesel had occurred. It has been carried out supervision of six cable percussion boreholes, over twenty window sample holes, survey/levelling of all locations, routine monitoring of free-floating layer and water in the boreholes and remedial works.

- GSG was commissioned to undertake a Geo-Environmental Investigation at the site of a distribution depot located on Southampton, Hampshire. The investigation included drilling nine window sample holes and logging of the ground conditions. Supervision of three cable percussion boreholes. It was understood that the proposed redevelopment of the site would comprise an extension of the existing warehouse building along with an open canopy structure.

- GSG was commissioned to undertake a preliminary Geo-Environmental Investigation on a private property at Plaxtol, Kent. The task included window sampling, installation of gas and water monitoring standpipes, dynamic probing and levelling. The existing industrial units and derelict paper mill buildings on site would either be relocated or demolished and the site be redeveloped for residential housing including gardens.

- Ground Solutions Group was commissioned to undertake a Contamination Assessment on a coach/bus depot in Brenzett, Kent. It was understood that the site had been earmarked for redevelopment to comprise residential housing.

- Part of the team of an ongoing environmental monitoring programme at operational landfill sites (Whitehall quarry and West Hythe). The task included landfill gas and water quality monitoring and reporting, in relation to available national guidelines, to the Environment Agency.

- GSG was commissioned to provide environmental consultancy in a waste depository associated with a boron processing plant on the outskirk of Dunkerke, France. Because the process plant was closed the waste disposal facility was no operational.

In this thesis some names, analysis results, site address and other details have not been reported for privacy purpose.

With this work experience it has been possible to have a direct contact with the British approach on the different phases of the Site Investigation and with the matter of contaminated land remediation in England.