

Case Study

Phase I Hazard Identification and Assessment

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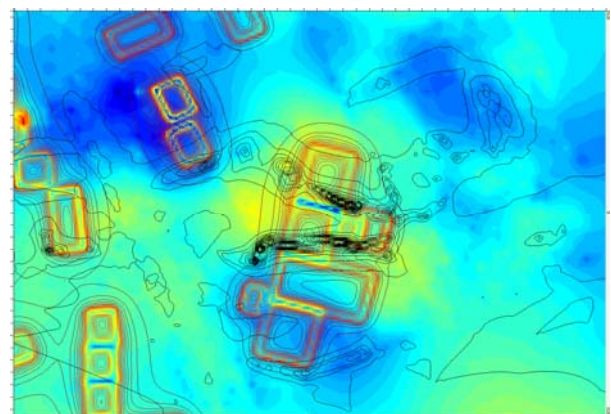
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Geotechnology recommends a phased approach to site investigations in accordance with guidance produced by the NHBC and the Environment Agency. Phase I should comprise Hazard Identification and Assessment. This initial Phase involves desk study review and a site walkover. These activities enable a Conceptual Site Model (CSM) and Preliminary Risk Assessment (PRA) to be completed and the scope of any intrusive site investigations or further work to be determined. If required, the additional work activities are taken forward for Phase II Risk Estimation and Evaluation where the identified risks are evaluated in greater detail. Geotechnology has extensive experience of conducting Phase I and Phase II studies for clients as part of the planning process, to complement due diligence during site acquisition or as standalone projects.

Proposals for a residential development comprising twenty houses on a 1.4 Ha site were prepared for submittal to the Local Authority for Outline Planning Permission. Pre-application discussions with the Local Authority revealed that the Application would need to be accompanied by a Phase I study.

The overall objective of the Phase I study was to identify and assess hazards potentially present at the site. To achieve this site history needed to be pieced together, potential contamination sources identified and the sensitivity of the site within its environmental setting determined. To assess each of these aspects information was obtained from several third parties, supplemented by information already held by Geotechnology. In some cases this information was freely available but in others a fee was paid to secure the information.

Based on a review of historical ordnance survey maps and geological base plans the site was found to be located in an area of historic mining and industrial activity. Review of The Coal Authority Mining Report and mine abandonment plans



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indicated several mine entrances to be present at the site and that parts of the site were undermined. In addition to the previous mining activity, the review of the historical ordnance plans indicated that a Chemical Works was once located adjacent to the site and that several rail sidings passed in close proximity. Records held by the EA also indicated that inert, industrial and household wastes had been deposited at the site until relatively recently.

Geological base plans revealed the site to be underlain by Coal Measures bedrock overlain by an unknown thickness of superficial deposits. No major faults were mapped as crossing the site but one coal seam was indicated to traverse the site. Careful scrutiny of the vertical log of the geological plan indicated that additional coal seams may

outcrop on the site although these were not marked on the geological plan.

According to information provided by the EA, the site was considered to be located over a minor aquifer and outside of any groundwater protection zones. A controlled watercourse was however found to be located within 250m. Chemical and biological monitoring of this watercourse by the EA indicated the water quality to be good. No protected sites were found within the vicinity of the site.

Review of radon potential maps and flood maps indicated that the site did not lie within an area requiring protection.

Based upon the information gathered a



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diagrammatic and tabulated Conceptual Site Model (CSM) was developed. The aim of the CSM was to clearly define potential exposure pathways connecting hazards and receptors, on site and off site. The key hazards identified from the desk study were ground instability and contamination associated with the previous mining activities, contamination related to the adjacent chemical works and waste activities, and ground gas from the mine workings and degradation of the relatively recent waste deposits. Receptors considered to be at risk were site development workers, future site occupants / visitors, infrastructure and controlled water.

Within the tabulated CSM each identified exposure pathway was subjected to a Preliminary Risk Assessment (PRA). This process enabled Geotechnology to screen out potential risks that did not require further evaluation. The outcome was a clearer understanding of potential exposure pathways that required further evaluation.

The final step in the Phase I study was to determine the additional investigations and assessment required in Phase II. Geotechnology recommended that the potential presence of a range of contaminants at the site associated with the historical land use needed to be evaluated through a statistically sound ground investigation initially comprising trial pits set out on a regular grid. This data would enable the level of contamination to be directly investigated and human health and environmental risk assessments to be initiated. To investigate the presence of shallow mine workings a phased approach was suggested with the preliminary intrusive investigation comprising trial pitting around the mine entrances and rotary drilling of the shallow coal seams. To enable the assessment of risks from ground gas the installation of permanent gas wells was also recommended.