



Development of a GIS based tool to assess engineering geological and geotechnical ground conditions in Greater Manchester, UK

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The Greater Manchester (GM) Metropolitan County, which comprises ten boroughs, has an area of 1,277 km² a population of 2.3 million and is one of the largest conurbation areas in the UK. It has a long industrial legacy beginning in the early 19th century. At this time Manchester and surrounding towns, now mostly within Greater Manchester, became the largest cotton spinning centres in the world and produced 32% of the world cotton in 1871. Coal from the local coal mines fuelled the industry. Chemical and heavy engineering industries grew up, in part to support 'king' cotton. This industrial boom resulted in rapid and unplanned urbanisation. However, the cotton industry declined during the late 1940's onwards leading to de-industrialization. As a result, redevelopment has taken place, for example, Trafford Park, Ancoats and New Islington. Piccadilly and Northern gateways are in a development stage. The latter will host 15,000 new homes. The Greater Manchester Authority has introduced a new plan to redevelop the area including 227,000 homes and creating 300,000 jobs by 2035.

Civil engineering projects should include appropriate ground investigation. The desk study is an initial phase of the investigation in which existing information and data are gathered and assessed to provide a risk register to the project and enable an efficient suitable design for the intrusive investigation on site. The outputs of investigation on site with the desk study are used to design the construction and identify any outstanding risks that need to be mitigated. To support the desk studies for engineering projects in the Greater Manchester area, this study aims to develop a desk study tool. Data collated in a GIS environment are geology, hydrogeology, land use, geohazards dataset, mining hazard, data from boreholes, and infrastructure location maps such as utilities. As Greater Manchester has a long industrial history, information on previous land use is included grouped in industry types as this will indicate the types of contamination which will impact on the environmental ground investigation.