EM Conductivity Meter to Locate Ground Contamination

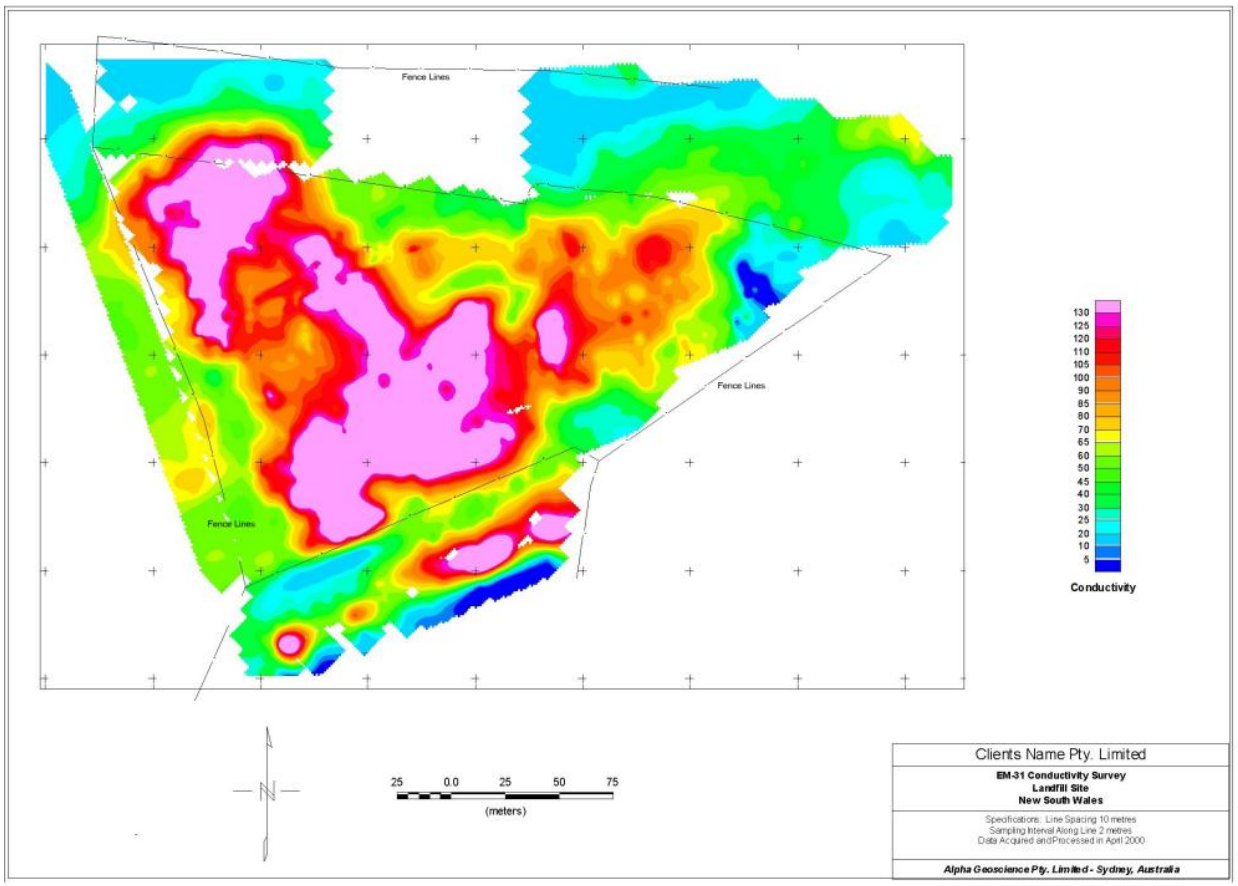
Introduction

Chemical pollutants infiltrate soils and are very hard to determine the extent without a very detailed soil-sampling program. With an EM Conductivity Survey, a very quick approach can be used to map the extent of the contamination. The technique is non-intrusive and can be undertaken by walking over the site carrying the unit or by mounting it on a 'Quad cycle' to cover much larger areas.

The image below is of a landfill site, which was polluted with liquid chemical waste placed into a number of landfill pits. From the image, the extent of the pits can be seen and also areas where contamination can be identified as moving off the site.

Survey Specifications

This survey used an EM Conductivity Meter from Geonics in Canada; this unit is a frequency domain EM system. It has a digital recording system for downloading and processing in the office. The data was collected in distance based sampling mode with a sample interval along line of 5 metres. The line spacing on this survey was 10.0 metres. The photograph below shows the system in operation on a survey.



Data Acquisition

The data was acquired using a cotton odometer to measure distance down the line and control lines were established every 100 metres taken off a surveyed grid. The line spacing was ten metres and road markers were used to indicate the position on the control line of the line to be walked.

Data Processing

The data was processed using the Geosoft Montaj Mapping Software Package from Geosoft in Canada, which is particularly well suited to the data processing and imaging of the EM data. No filtering was applied to the data. The client for this project supplied an AutoCad drawing of the site and this was added to the colour image of the EM data.

Dualem System Operating on a Quad Bike

Summary

The EM is very well suited to cover a large area of ground in a short period of time to determine the presence or otherwise of chemical contamination. In this particular example, the extent of the high ground conductivity readings are indicated by the red and yellow areas on the image, with the blues and greens being lower conductivity readings. These correspond closely to the pits that were one the site.

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Ref: Environmental EM Conductivity for Contamination v.1.docx