Geophex Ltd.
30 years of excellence in EM instrumentation
info@geophex.com
+1 (919) 839-8515

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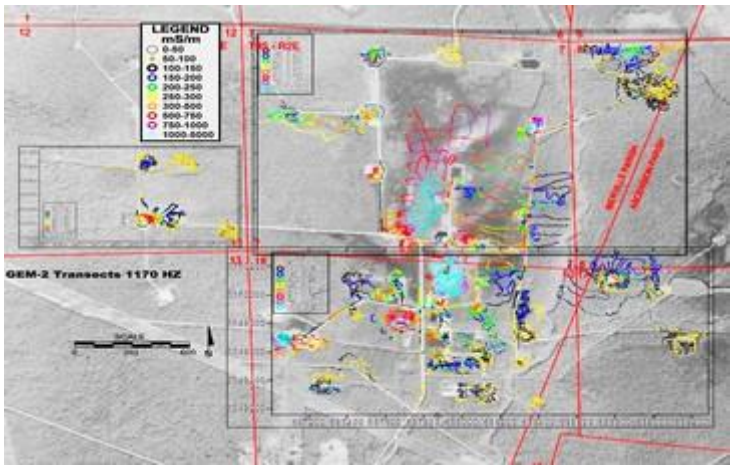
GEM-2 Identification of saltwater contamination: case study

A recent issue of the FastTIMES magazine published by the EEGS (vol.23, issue 4) was titled *Geophysics for Oil and Gas Sector Impacts". The* issue included a case study using the Geophex GEM-2, titled "Identification of saltwater contamination with a hand-held EM instrument and comparison with soil boring samples". The case study was jointly published by Geophex and Icon Environmental Services of Port Allen, Louisiana.

The extraction of underground oil or gas usually also generates large amounts of water, called 'produced water'. If not properly managed, it can cause local soil and water pollution.

In this case study, a GEM-2 handheld conductivity meter was used to quickly identify problem areas. In this case, the conductivity variations were large enough that the operator could explore the areas of greatest interest (as constrained by the local terrain) rather than following a fixed grid. This type of opportunistic approach can be very efficient. The whole survey area covered several square miles, but the immediately mapped area shown here required less than 2 man-days to survey.



This case study confirms that maps of apparent electrical conductivity (EC) are very useful in locating potential soil contamination. In the case of brine contamination, the EC values correlate well with laboratory analyses of both soil conductivity and concentration of chlorides. More generally, any type of contaminant whose EC contrasts with the environment can be delineated.

Because of its sensitivity, programmability, and ease of use by a single person in difficult terrain, the GEM-2 can greatly reduce the cost of many surveys. The complete paper can be found in the FastTIMES archive at https://enengs.memberclicks.net/latest-issue. The survey was carried out by Icon Environmental Services (www. Iconenv.com).

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