

CHEERS!

We have just returned from the annual meeting of the Society of Exploration Geophysicists (SEG), which took place in the city of Houston. This is always an excellent opportunity for us to personally meet with many of our friends and colleagues, whom we communicate with by e-mail through the rest of the year.

The SEG has formed during this meeting, its Mining & Geothermal Committee, where our manager José R. Arce is part of, and is now legally being formalized. Starting on SEG 2006 in New Orleans, the committee will be in charge of promotion and creation of sessions and presentations in mining & geothermal geophysics. We now have a deadline of April 12 for submission of papers for these sessions.

We enjoy being part of this new stage in the SEG and we will take all necessary efforts to help the Committee achieve its goals.

José E. Arce

INSTRUMENTS & NEW METHODS

As we mentioned in our previous edition of *Perfiles*, our new digital cesium vapor magnetometer, Sintrex Navmag, is already being operated with an external Omnistar GPS receiver with sub-metric precision. We are currently waiting for our last-generation TDS Ranger data collector unit with Solo Field software, so that our GPS receiver may be used without the need of the Navmag console.

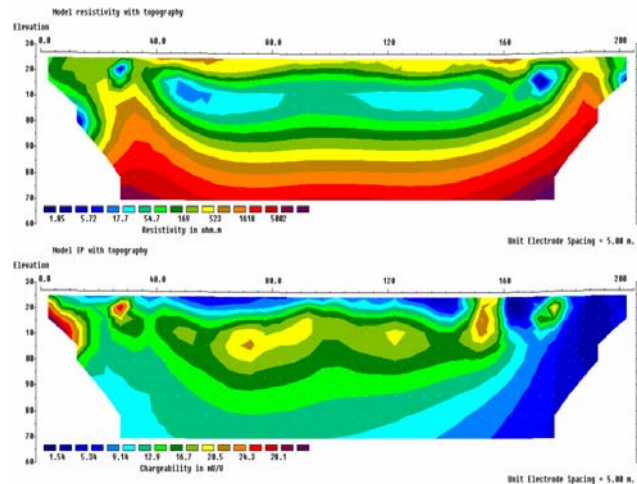
Also, just as we previously announced, we have been applying, since mid July, the state-of-the-art seismic method MASW for precise determination of shear wave velocities along selected profiles. In a future edition of *Perfiles* we will show some of our applications using this new technique.

RESISTIVITY & IP OF DAM STRUCTURES

One of the most common problems in mine operations is stability of dam structures of tailings and water reservoirs. Throughout the years we have employed various geophysical techniques for these surveys; the most common method used is seismic tomography, but we have also obtained very satisfactory results applying resistivity and induced polarization 2D modeling techniques. The examples we show next are from two mining operations and under very different geological environments.

The first case shown is from a small tailings dam, with an approximate length of 200 meters. The electrode separation was 10m, modeling cell size 5m, and maximum penetration around 60m, with the Pole-Pole array. The top section shows Resistivity model while the bottom Chargeability. Resistivity shows a drastic change that may be first interpreted as bedrock in the yellow-

orange-red color range, above 400 ohm-meters. The layer type contact above this "bedrock", shown as light blue-green and with less than 150 ohm-meters, shows the saturated portion of the dam. Under this top layer it is difficult to discriminate between bedrock and compact dam material. The bottom section shows a chargeable response (above 15 mV/V), spanning from the saturated portion of the dam to the upper bedrock. We believe this is probably caused by the use of mining operation waste rocks containing metallic sulphides.



The next example was taken over an auxiliary dam axis on a tailings reservoir. The dam, shortly after it was built, developed several fractures on different planes, parallel and perpendicular, and it became necessary to understand the depth extent of these cracks in order to design a stability solution for the dam.

Electrode separation was 2.5m and model cells 1.25m, with an approximate depth reach of 15m using the Pole-Pole array. The possible fracture zones have been marked as continuous black lines in every location where the dam's core (yellow-orange-red) appears interrupted or "cut". We should emphasize the major fracture at distance 17m as the most significant defect on the dam, as well as minor failure planes of distances 80m, 95m and 110m, which might be a consequence of displacement of the main fracture.

