

Over the next few weeks, geophysicists working for OceanaGold Waihi will be carrying out CSAMT ground surveys and gravity surveys along some Waihi streets. CSAMT (Controlled Source Audio-frequency Magnetotellurics) surveys have been carried out in various parts of Waihi between 2004 and 2011. In this Update we explain how these techniques work and the information they provide. Additional information will be provided in a letterbox drop prior to the surveys starting.

## CSAMT

### Survey team

**members** place a series of porcelain pots about the size of coffee mugs along the side of the street.

Each pot will be connected with a wire to the next one to form a chain that may be up to 140 metres in length, before being connected to an instrumentation box. There is no electrical current in these wires or pots.

Several kilometres away, on farmland, two electrodes will be placed on the ground about 1500 metres apart and joined by a wire. A small portable generator is connected to the electrodes to power up the system. The signal is received by the pots.

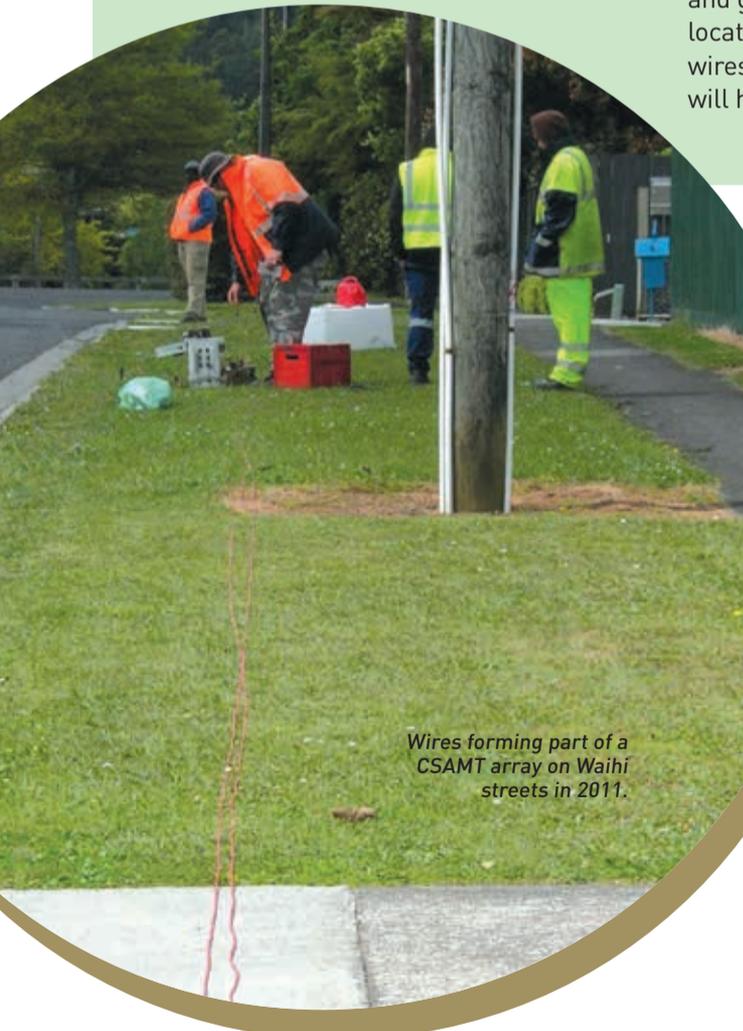
What are we doing?

What is it for?

The connected electrodes set up an electrical field that can be measured for a considerable distance. That's the function of the porcelain pots and the wire along the side of the road. As the electrical field radiates from the source its intensity can be measured at various locations. Different ground types produce different readings. Clay is a very good conductor of electricity whilst quartz is very poor. Analysis of the results helps produce a better understanding of what is below the surface.

**There is no danger** to the public from the equipment or the survey, and the environment is not affected. The electrodes and generator on farmland may be at each location for a couple of weeks, the pots and wires on the street for a couple of hours. Each will have a survey team member present.

Is it safe?



Wires forming part of a CSAMT array on Waihi streets in 2011.

## Coming Up

### SUPA Community Meeting

Monday 21 November 11.00am, Education Centre

The first community meeting following the granting of consents for the Slevin Underground Project Area. All welcome.

### Blast Vibration Workshop

Monday 21 November 1.00pm, Education Centre

Want to know more about vibration? Come and listen to independent experts. Bookings required. Contact 0800 WAIHIGOLD (0800 924 444)

## GRAVITY Surveys

Gravity surveying measures the change of rock density by looking at changes in gravity. This process provides us with a sub-surface geology of a surveyed area so we can 'see' what is underground.

What are we doing?

A portable gravimeter the size of a small suitcase is placed on the ground at points along a predetermined route. The operator records a reading at

each point before moving on to the next. Once there are enough readings recorded, the data is processed by computer to create a detailed map of the surveyed region. The processed gravity maps define regions of rocks and minerals with different densities by assigning colours.



A portable gravimeter detects minute changes in gravity.

The red end of the spectrum indicates more dense rocks, the green end indicates lighter rocks. Interpretation of this data helps us gain an understanding of what mineral types and resources may be found in the surveyed area.

What is it for?

**Like all matter**, the Earth generates a gravity field that can be measured using specific instrumentation. The Earth exerts a constant pull of gravity which we experience as things either falling, or being held to the ground. The force of gravity is not the same at all points around the planet, it varies in different places. Mountains and ocean trenches can affect the Earth's local gravity field. These, as well as the composition of elements within the Earth's crust all cause micro-variations in gravity. We measure these micro-variations by using a gravimeter which works by recording the downward acceleration of mass from the minute fluctuations of a finely balanced spring which is extremely sensitive to incredibly small fluctuations in gravity.

Analysis of the results helps produce a better understanding of what is below the surface.

