

WE GET THE BIG PICTURE

# Geotection

## Resistivity Monitoring System



HGI is an innovative, solution-oriented geophysical consulting company and service provider to the environmental, engineering, ground water, mining, oil & gas, and natural resource exploration industries. We specialize in the application of 3D geophysical methods for time lapse subsurface characterization and monitoring of fluid flow through geologic materials.

Innovation, quality of work, detailed focus, and flexibility are hallmarks of HGI's service. Our ability to create custom-fit solutions based on individual client needs makes us an industry leader in the field of geophysics and geosciences.

For more information on HGI's products and services, please visit us at [HGIworld.com](http://HGIworld.com) or call us at: 1-866-647-3315



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## Technology Profile

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HYDROGEOPHYSICS, INC INTRODUCES ITS NEWEST RESISTIVITY ACQUISITION SYSTEM, "GEOTECTION" A 180 CHANNEL SYSTEM PROVIDING A COMPLETE MEASUREMENT SWEEP IN LESS THAN 25 MINUTES FOR MOST ARRAY TYPES.

Subsurface Imaging

Innovative Solutions

## HGI Innovation

In the field of geophysics, data acquisition is a key limitation in the resolution and temporal understanding of subsurface hydrology. Facing this challenge, scientists and engineers at hydroGEOPHYSICS saw the limitation as an opportunity and developed Geotection, the fastest and most accurate resistivity data acquisition system on the market today. The Geotection system can sample 180 electrode channels simultaneously providing rapid data acquisition at a rate 22 times faster than any other resistivity data acquisition system currently in production.

With the system's flexibility and capacity to sample and store data so quickly, Geotection can act as both a long-term monitoring and short-term rapid acquisition system that is capable of high temporal and spatial resolution. Geotection can collect, store, and provide information in near real-time on subsurface solution migration. This versatile mobile acquisition system can be operated remotely via satellite and has a multi-level alarm system to alert operators of power disruptions, equipment problems, and extreme climate changes through SMS messaging and email alerts. Additionally, Geotection can be powered from a generator or direct AC and the internal climate controlled trailer has enough room to work, eat, and sleep.



HGI professionals have the skills and experience to support every aspect of your project from concept and design to acquisition and interpretation.

## Use & Application

While Geotection has all the capabilities of current market resistivity acquisitions systems, its core purpose is large-scale rapid data acquisition designed to track accelerated subsurface fluid movement in 'near' real-time. The ability to understand and visualize this movement through geophysical methods is revolutionizing our understanding of the hydraulic nature of both engineered rock piles and natural geologic environments, creating new solutions to old hydrological challenges.

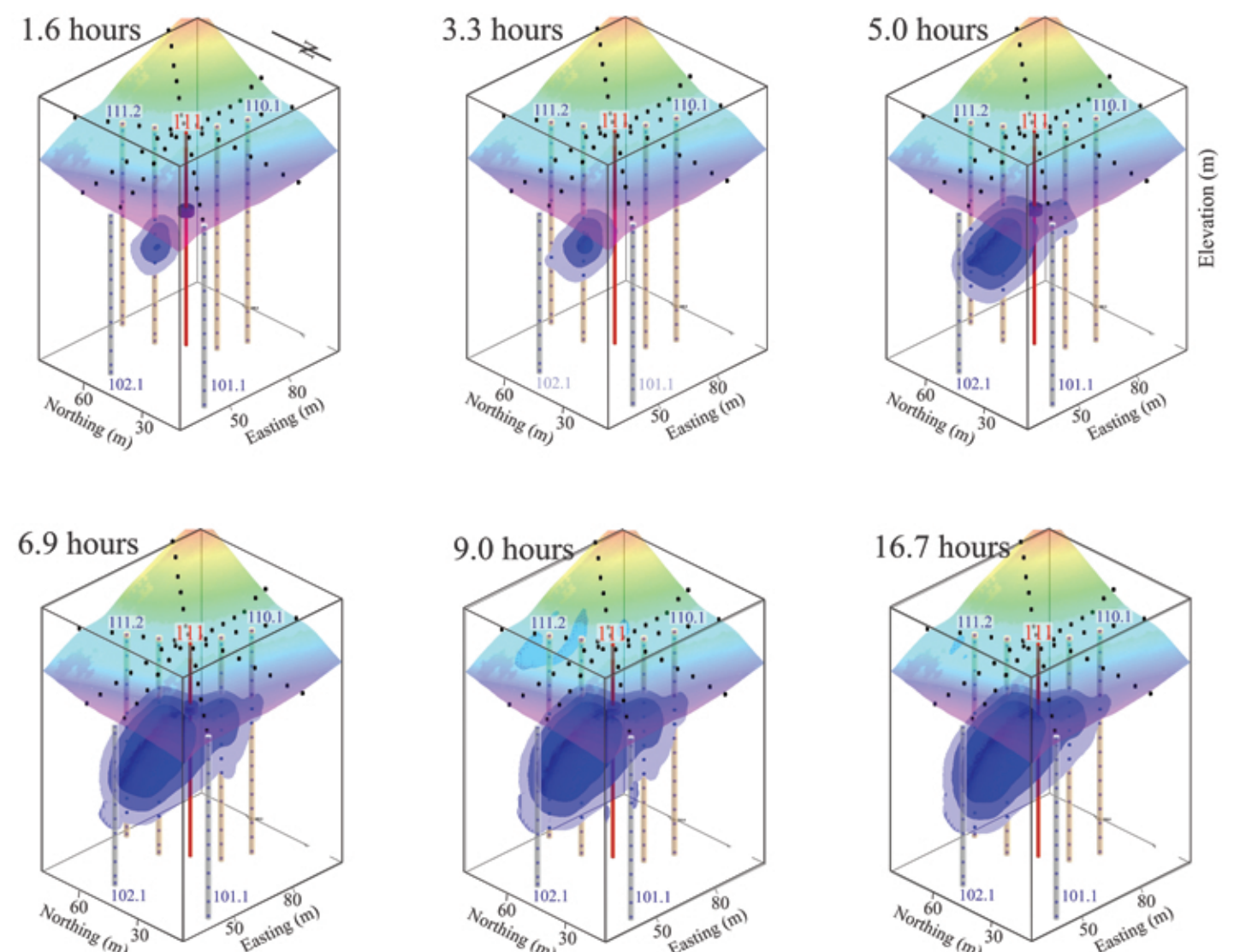
Geotection is particularly suitable for monitoring water or reagents directly delivered through surface application, well injection, or pumping. These are common means to amend soil and groundwater chemistry for environmental applications and to increase the efficiency of resource extraction in the mineral and petroleum industries. Resistivity monitoring with Geotection has the distinct advantage of sensing changes far from the sensor location by measuring a degree of energy transport through the entire monitored area. With a sufficient number of sensors placed either on the surface or down adjacent monitoring wells, the field can be mapped effectively to understand the volume of influence by any reagent.

## Examples & Plots

A high pressure injection experiment was conducted at the Cripple Creek and Victor Gold Mine to increase metal recovery within the heap (or engineered rock pile of low grade ore). Injections occurred within wells along several depths at rates that usually exceeded 800 gpm for several hours at a time.

HGI used the Geotection resistivity monitoring system to acquire information about the injection coverage and direction (or sweep efficiency). A total of 173 electrodes, including surface electrodes, nested borehole electrodes, as well as the series of injections wells themselves, were used to pass electrical current and measure voltage. The eight-day experiment produced 780 full reciprocal datasets for evaluation.

High quality resistivity data acquired from Geotection were inverse modeled to produce volumetric images of solution coverage. Contours below show percent change from background for two snapshots taken approximately 4 hours apart during the injection at the 90ft depth. Directionality of solution movement was confirmed by monitoring a decreasing contact resistance in the northern borehole electrodes.



## Our Clients

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Alamos Gold    Anglo Gold    Barrick    Coeur Mining    Kinross Gold    KGHM    Newmont Mining    Sago Mine    Pacific Copper