

How can I use the Cesium Magnetometer for Mineral Exploration?

The depth of exploration is determined by the spatial wave-length of the magnetic anomalies revealed during the survey. It is important to understand that the measurement of the magnetic field at a single point does not provide any depth information. A single measurement includes the contribution of the magnetic field from many sources and so it is necessary to measure the variation in magnetic field strength at many different locations in order to determine the location of the objects that are causing the magnetic field variation.

Magnetic field surveys are used during exploration for almost all types of minerals. Magnetic survey data are usually interpreted in an effort to gain a better understanding of the geologic structure beneath the survey area and this understanding is used as a guide for conducting follow-up surveys using different techniques or for choosing the optimum placement of exploratory drill holes. In addition to this, magnetometer surveys are commonly used as a means of direct detection of iron and nickel ore and also for gold exploration. In the case of gold exploration, the target mineral is magnetite which, because of its density, is used as an indicator in locating gold in fluvial deposits. Similarly, an absence of magnetite is used as an indicator of possible gold deposition in epithermal conditions.

When surveying a large area or when conducting the survey of a small area over a long period of time, it is necessary to remove the back-ground variation of the Earth's magnetic field. Your engineer is correct in being concerned about the effects of magnetic storms and these are the more extreme examples of the diurnal magnetic field variation that is always present. It is customary to use a base station magnetometer to recognize and remove this variation component. We recommend our model G-856AX proton precession magnetometer for use in this role. The G-856AX is a very stable, relatively inexpensive magnetometer and includes a very stable and accurate clock, as do our models G-858 and G-859. When used as a base station, the G-856AX clock is synchronized with the survey magnetometer's clock and it is set up on a tripod and configured to run automatically in a fixed location. Each of the measurements that the G-856AX records will be automatically recorded, along with the date and time of the measurement. The same thing happens automatically for each measurement made with the roving (survey) magnetometer. Then, when the data are down-loaded to the processing computer, our MagMap2000 software can be used to process these data sets to remove the diurnal variation from the survey data and perform other data processing and analysis functions. Attached, please also find a quotation for our G-856AX with base station accessories.

Direct Detection:

Mn / Cu / Mg are not ferromagnetic and also none of the common mineral sources of these elements are ferromagnetic. So direct detection of Mn / Cu / Mg is highly unlikely. I would recommend that you retain the services of an economic geologist familiar with your prospect area to see if a magnetic survey useful in gaining understanding for the geologic structures that may be important for locating concentrations of minerals that include these elements.

<http://support.geometrics.com/kb/questions.php?questionid=75>