Our Concept of "Geophysical Engineering"

"Geophysical Engineering" like conventional engineering is a multi-disciplinary use of science, mathematics, logic, economics, and practical observational experience to find solutions to a particular problem. Data is collected and a model is derived to test potential solutions-- or in the case of geophysics to test and ultimately decide on a suitable evaluation or interpretation of subsurface conditions. This interpretation is made more accurate by the integration of direct information and data from other sources such as boreholes. In the end a working image or model of subsurface conditions is generated and used to solve various problems. Through out this process the following considerations are very important.

- Good quality data must be collected and relied upon more heavily than poorer quality data. You should work first with the good data and then proceed to the bad data to see how it conforms.
- If possible, first collect data across an area of known subsurface conditions to establish the geophysical response to those conditions you are searching for. Then continue collecting data in unknown areas to look for this response.
- Computer modeling is based on mathematical simulations of the structure and geophysical properties of the earth. More than one unique model can often be generated to fit the data collected. Unrealistic results or artifacts are also often produced by this modeling. Subsurface computer models must therefore be compared to direct information and data from other sources such as boreholes.
- The collection of two or more kinds of geophysical data can help to improve the accuracy of a subsurface interpretation. Two or more independent models converging to the same result can help to validate that result.
- When conducting a subsurface investigation it is important think in terms of "multiple working hypotheses" as articulated by geologist T.C. Chamberlin in 1890.