

## ABSTRACT

Because of technology development, the needs for energy is also getting bigger, energy exploration in the earth continues to be carried out in order to meet the world's energy needs. A tool that can detect soil material before drilling is needed. Each material has a different density, the difference in density produces a back effect

A geophone is a transducer that converts seismic energy or vibration into an electric voltage that can be measured accurately, the results obtained can be recorded in a recording station. Simply stated, this occurs from the mass vibrations that are coiled around a wire and are in a magnetic field, when a vibration occurs, the mass will move at a certain speed and produce an electromotive force that can be read with a simple voltmeter.

Geophones can be used to detect differences in material that is below the surface of the ground. This is done by carrying out artificial vibrations and receiving these vibrations with the geophone. To measure the vibrations that will be captured by

the geophone, it begins by arranging the geophone configuration to be placed in a straight line with the wave source. The data obtained from the survey is the wave travel time from the source to each geophone indicated in the wave traces.

In this final project obtained with a geophone sensor that can read the speed of waves in passing through a medium. Each medium produces a different speed - the more dense the density of the medium, the faster the velocity of the wave propagation through it. In this final project the fastest is split stone with 1.62ms, brick is slightly slower with 4.02ms, and sand is the slowest with 15.86ms.

**Keywords:** Geophone, transducers, wave trace