

Ruly fields is one of the productive field on North Sumatera Basin, geographically located approximately 110 km northwest of Medan dan have been producing since 1928 rely on reservoir from Keutapang Formation.

A decrease in production and not stable condition of oil price makes company need the approach or alternative method that can increase oil production in Ruly Field. Scientific approach that will be applied is the presence of low resistivity reservoirs in Ruly Field.

Generally, anomaly on low resistivity reservoir has resistivity value between 0.5 – 10 ohm.m. Characteristic of low resistivity reservoir is low contrast resistivity between hydrocarbon zone and water zone. This situation is frequently observed in Ruly Field. Production test data and production data in several productive zones shows hydrocarbon with resistivity value less than 10 ohm.m and the low contrast presence between water and hydrocarbon zone.

The purpose of this thesis to identify the reason of low resistivity and correction on petrophysical determination to get accurately porosity and water saturation in Ruly Field. This thesis is made by integration of log data, thin section, XRD (X-ray Diffraction), SEM (Scanning Electron Microscope), Shieve, SCAL (Special Core Analysis, water analysis, and production test. Presence of clay minerals and conductive minerals become one of the main reasons of low resistivity occurrence in the Ruly Field. J-function is one of saturation water determination method to obtain optimum result of Sw value. More than 10 zone has been identified as potential candidates for future perforated in low resistivity reservoir.

Keywords : low resistivity, petrophysical, log, j-function.