Resistivity Surveys for Assessing the Potential for Gem Deposits in Tambon Ploi Waen, Amphoe Tha Mai ,Changwat Chanthaburi

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Abstract

Ten 1-D resistivity soundings were acquired at Tambol Ploi Waen, Changwat Chanthaburi. The objective was to investigate the gem-baring potential of the sediments. Schlumberger array was selected for electrode configuration for all sounding stations. Based on the results of the surveys, only 4 sounding stations show the potential layers of gem deposit, which are station number 1,2,3,4. In addition station number 1 consists of two gravel-bed layers, located about three meters and thirteen meters depth.

1. Introduction

Geophysical techniques are very useful for geologist and geophysicist for delineating the geological structure with great potential. Resistivity method is selected for this study because it is cheap and the equipment is easy to operate. The data interpretation is also not complicated. However, this method should be compared with the other methods or data to suit the real geological situations. The objective was to investigate the potential of the gem-baring sediments. The geophysical technique used in the study was a DC resistivity method. The Schlumberger array was used for electrode configuration of this study (Chenrai, P., 2003).

2. Experimental Results and Discussion

The study area (Fig.1) is in Tambon Phloi Wean, Amphoe Thai Mai, Changwat Chanthaburi between longitudes 102°01´29´´-102°03´10´´ and latitudes 12°35´38´´-12°37´13´´ in topographic map sheet number 5434III on a scale of 1:50,000 with approximately 12 kilometers with 10 survey station (Fig.2).

From the results of resistivity data interpretation (Fig.3), it can be recognized that the gravel beds - the key layer of gemstone deposit - have been identified in station numbers 1, 2,3,4,7 in the study area. However, only four stations have the great potential to bare gems, which are station number 1, 2, 3, and 4.
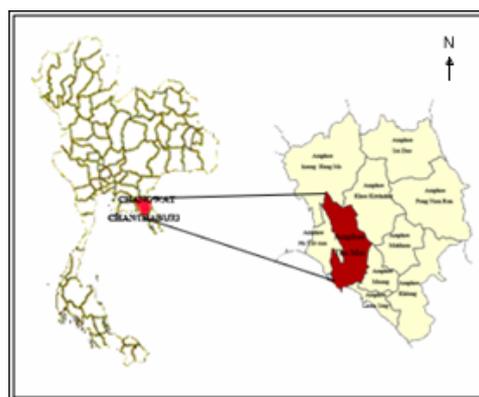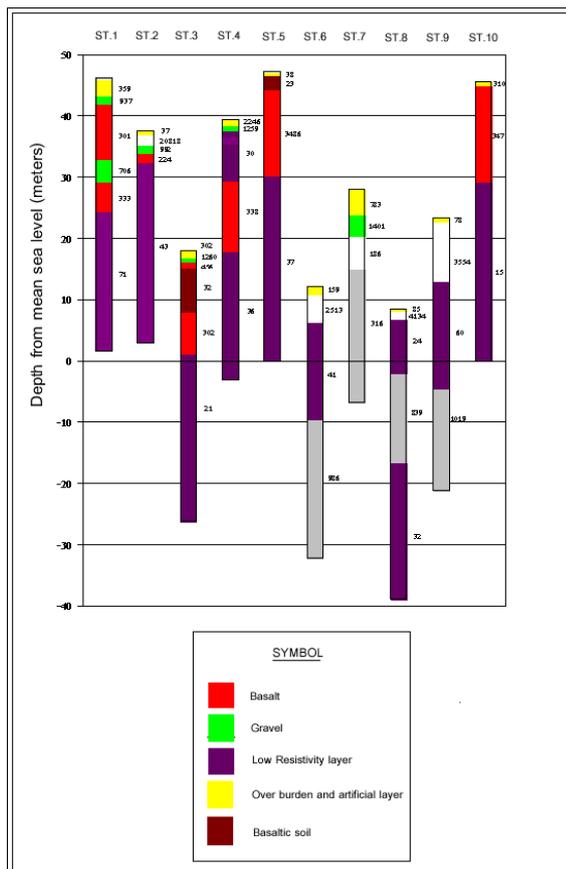

Figure 1: Location of the study area.
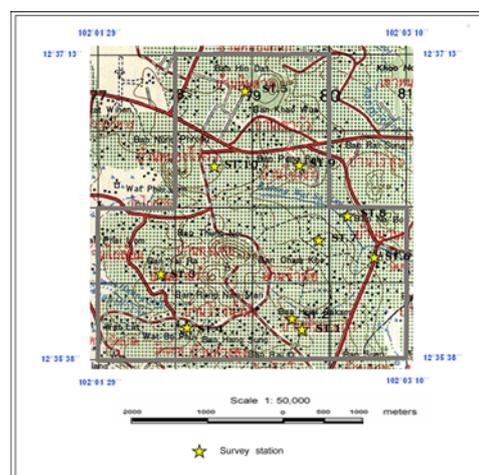
Figure 2: Location of the resistivity surveys.

Even though station number 7 contains gravel bed it may not be of any potential for gem deposits as the basalt layer has not been found in this particular spot as inferred from the borehole information. Moreover, the interpretation of station number 1 indicates that two potential gravel beds were identified, the depth of first layer being about three meters and the second layer at about thirteen meters depth. Most of the lower layers in the resistivity column have shown low value of the electrical resistance. These layers may be characterized to be claystone or siltstone based on drilling information near this station. However there are some layers which show significantly high resistivity value and they can not be identified in this study because of inadequate supporting data.

3. Conclusion

The 1-D resistivity technique was successfully applied to indicate the potential gem baring sediments in the study area. Four sounding stations have been identified to contain the gravel bed which is believed to bear gemstone in Chantaburi Area. However, due to lack of drilling information, all the interpretations need to be verified. Other geophysical methods such as 2-D seismic reflection and 2-D resistivity imaging may be used to better image the subsurface in this area.

Acknowledgement

References

Chenrai, P., 2003. Resistivity Invesigation for Gem deposits at Amphoe Khlung, Changwat Chanthaburi. Senoir Project, Department of Geology, Faculty of Science Chulalongkorn University

Figure 3: The interpretation based on the resistivity survey at the survey stations