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GEOSPATIAL APPROACHES FOR SUSTAINABLE MANAGEMENT OF NORM DISPOSAL

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INTRODUCTION

In Malaysia, the most common activity related to TENORM are industrial activities related to the mining and the subsequent processing, resulting in the increase of the naturally occurring radioactive materials.

Norm industries in Malaysia coming from oil and gas and mineral and ore processing such as tin smelting, rare earth and titanium dioxide. The disposal of NORM residue is still a problem. For low-level activity residues, landfill disposal is one of the potential options. The residues that can be disposed of by landfill include primary residues, such as tin slag, iron oxide and red gypsum, and secondary residues from treatment, such as incineration ash, matured sludge from sludge farming and sediment residues from chemical extraction.

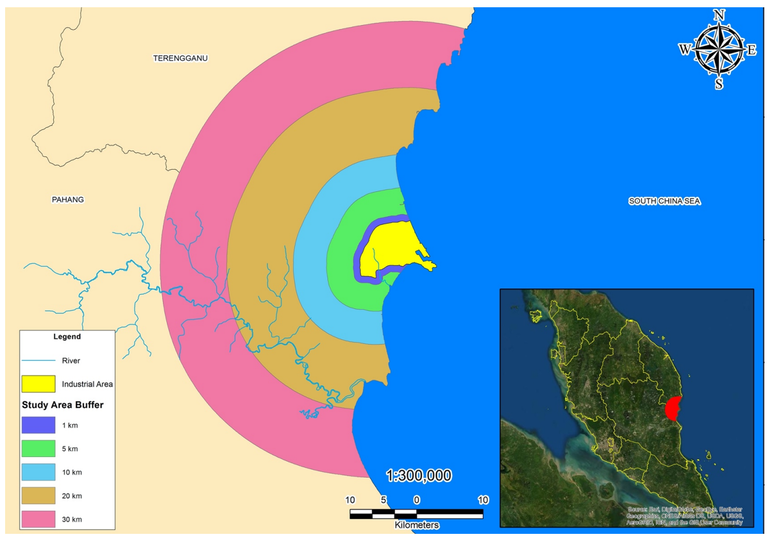

Fig. 1 Study area

Rare-earths miner has confirmed that a remote site in Bukit Ketam, Pahang, had been approved by the state government for a permanent disposal facility to keep waste from its production operations. The study area covers 30 km from industrial area which houses a world-class chemical and petrochemical industrial zone with four development phases totaling 8,600 hectares of land as shown in Fig. 1. With excellent infrastructure and facilities, the industrial area is rapidly expanding to become the leading chemical and petrochemical hub of the region.

METHODOLOGY

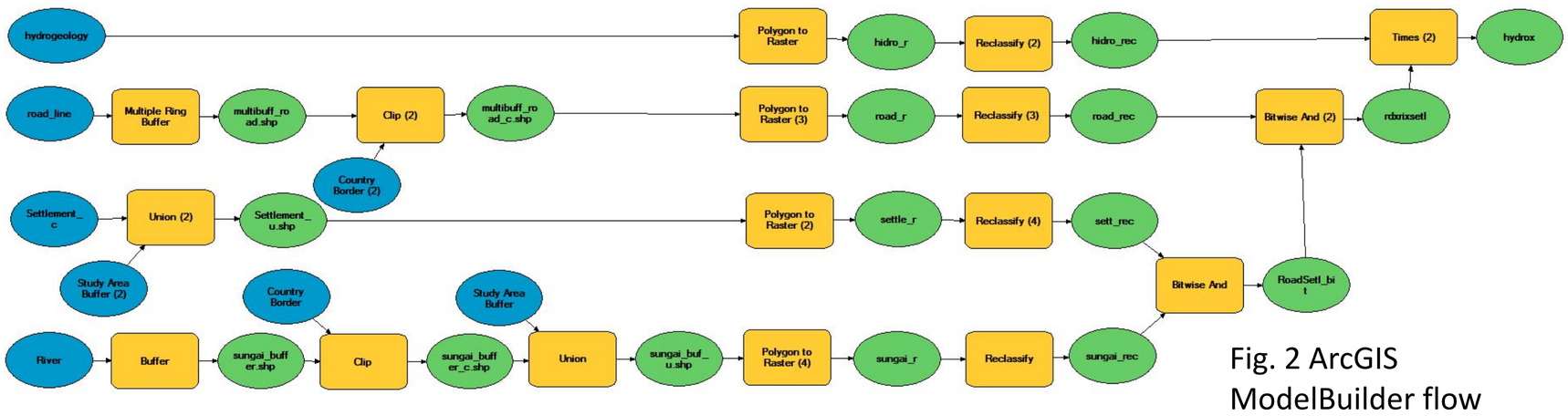

Fig. 2 ArcGIS ModelBuilder flow

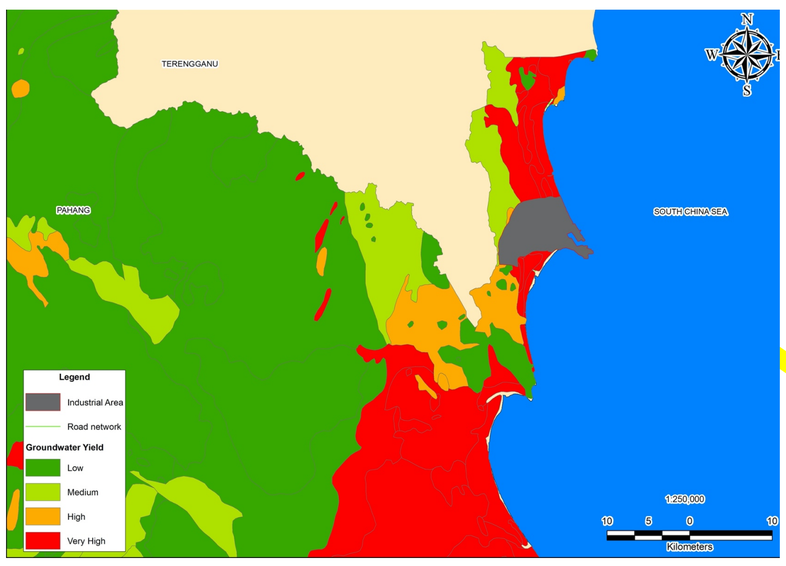

Fig. 3 Hydrogeological map

RESULT

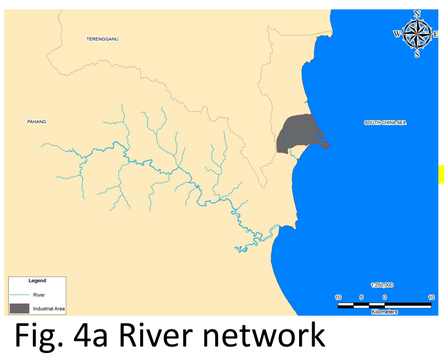

Fig. 4a River network

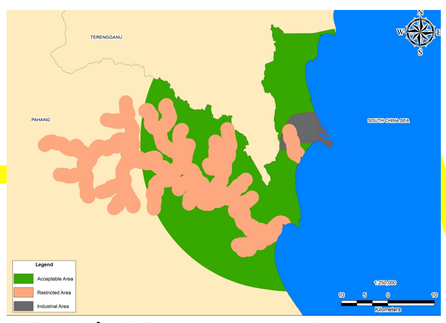

Fig. 4b River constrain

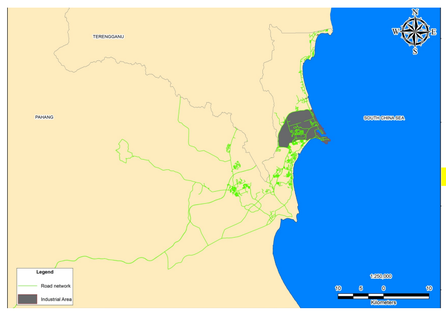

Fig. 5a Road network

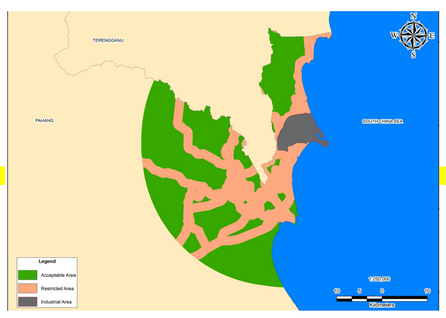

Fig. 5b Road constrain

Fig. 6a Landuse

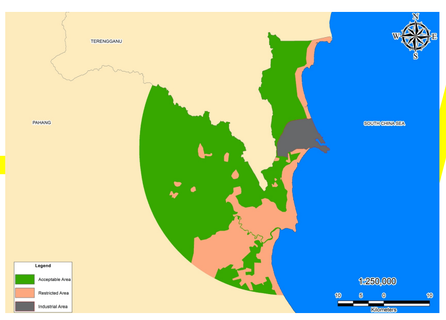

Fig. 6b Landuse constrain

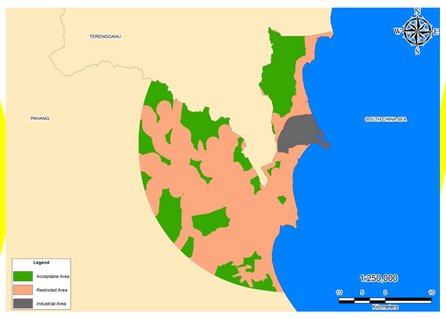

Fig. 7 Integration of road, river and landuse constrain

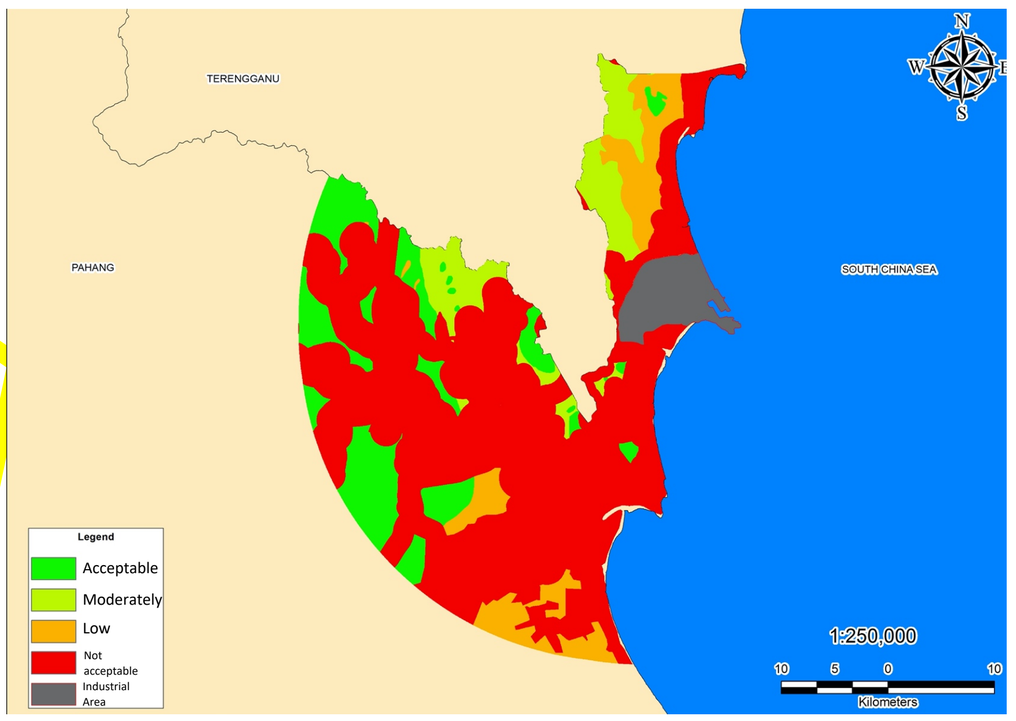

Fig. 8 Final map integration of hydrogeology and constrain map

CONCLUSION

- Geospatial strategies using minimal crucial criteria.
- Acceptable result can be used for further site characterisation and safety assessment.
- The method and criteria are not fi and can be change accordingly.
- The geospatial approach definitely improves the decision-making capability for planner due to time saving and cost effective of preliminary and regional works.