KUANTAN – MARS ON EARTH: ENVIRONMENTAL PROBLEMS & SOLUTIONS

by

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INTRODUCTION

•KUANTAN, MALAYSIA

•The capital city of Pahang in the East Coast of Peninsular Malaysia

•The ninth largest city in Malaysia

•Rich in natural resources including rain forests, lakes, minerals (i.e. tin, iron, aluminium)

•MARS

•Fourth largest planet in the sun solar system

•Referred to as the **RED PLANET** due to rich in iron oxide prevalent on its surface a distinct reddish appearance

INTRODUCTION

- What do this two places have in common??

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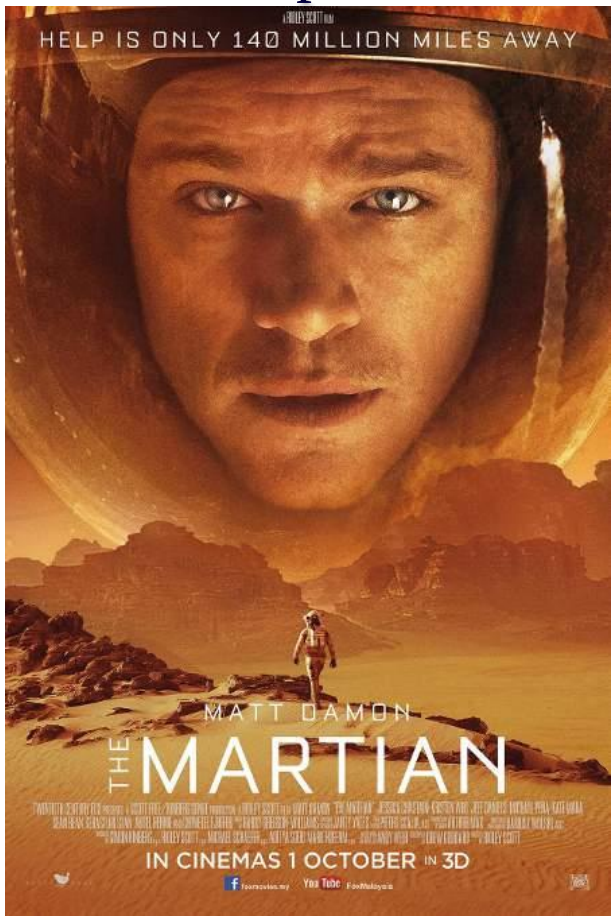
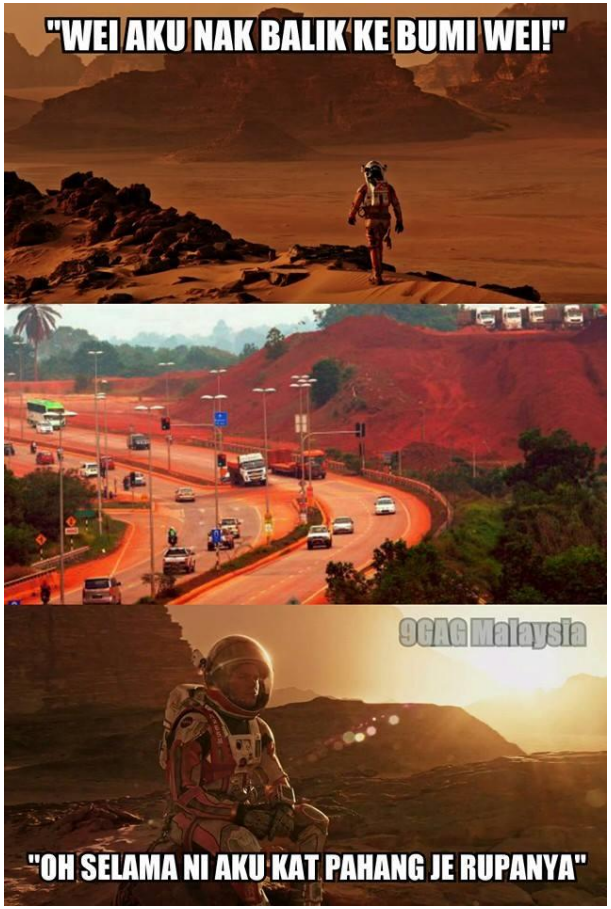




INTRODUCTION

- **KUANTAN, MALAYSIA**

- Over the past few months, bauxite mining has become a controversial environmental issue in Malaysia. Bauxite, a principle ore is a main source of aluminium.

- The presence of bauxite in Kuantan was first recognized almost eight decades ago in 1937.

- Kuantan's bauxite is characterized as laterite bauxite by high **ferric oxide** content ranging from 14.4 to 40.6% depending on different deposits

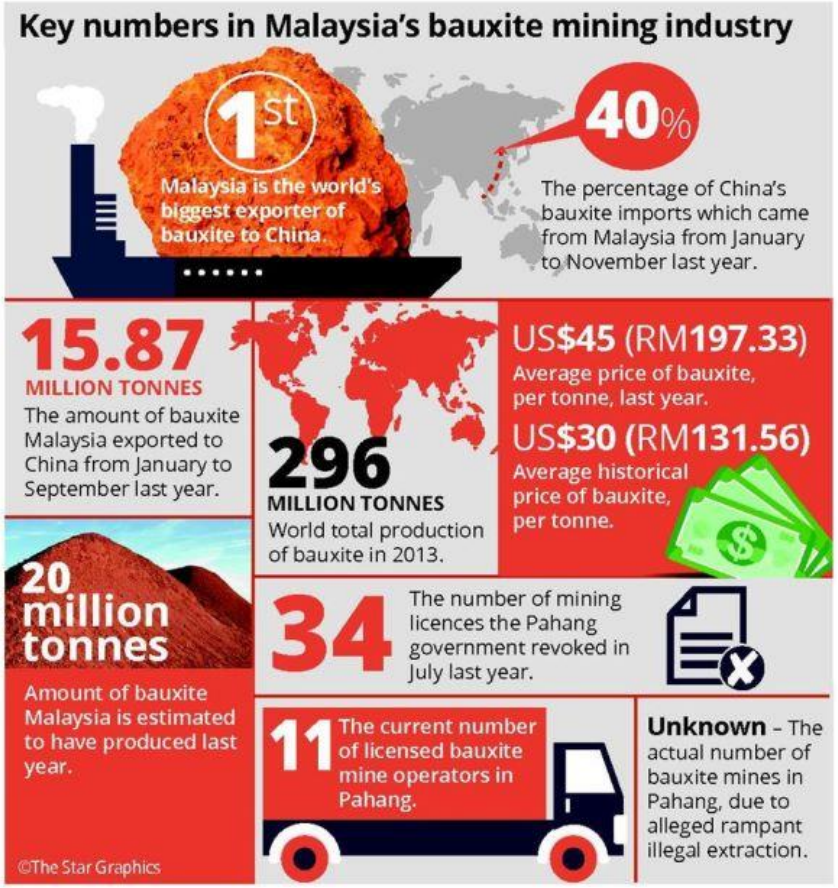
INTRODUCTION

•Aluminium Industry

• In 2016, Malaysia became the world's top producer, accounting for nearly half of the supply to China's massive aluminium industry.

•Annual output of laterite bauxite ore has

•increased from about 200,000 tonnes in 2013, to nearly **20 million tonnes in the year 2016**.



INTRODUCTION

- **BAUXITE MINING IN KUANTAN**

INFOGRAPHIC NST BY: AHMAD YUSRI

How bauxite is mined elsewhere

STAGE 01 Before mining commences, the land needs to be cleared of timber and vegetation. Alongside this process may be the collection of seeds and/or saplings, for inclusion in a seedbank, which will form the basis of post-mining revegetation of the site.

STAGE 02 The top soil is removed and stored for replacement during rehabilitation.

STAGE 03 Bauxite is extracted through open cast mining. The processes vary depending on the location. The layer under the top soil is known as the "overburden". The bauxite layer beneath the overburden is broken up using methods such blasting, drilling and ripping using bulldozers.

STAGE 04 Once the bauxite is loosened into manageable pieces it is generally loaded into trucks or conveyors and transported to crushing and washing plants or to stockpiles, before being shipped to alumina refineries, located close to bauxite mines. The conveyor system is quiet, dust-free and uses less land than road transport.

STAGE 05 Bauxite residue is washed and contained in the Bauxite Residue Disposal Areas (BRDA) or Residue Storage Areas (RSA) which varies depending on the land and technology availability, climatic & geographic conditions, logistics and regulatory requirements.

STAGE 06 Topsoil replaced and agreed crops re-established.

STAGE 07 Washed residue is filtered to produce a dry cake to minimise the land area required for storage and the risk of leakage to groundwater. The residue is thickened to a high density slurry, deposited and allowed to consolidate and dry before successive layers are deposited. This forms a slope on the deposit, allowing rainwater to run off and minimising liquid stored in the disposal area; lowering risk of leakage and improving structural integrity.

STAGE 08 The residue is pumped into land based ponds where naturally impervious layers or sealants minimise seepage. Bio-remediation is carried out to convert bauxite residue into a well-structured soil through chemical and physical treatment.

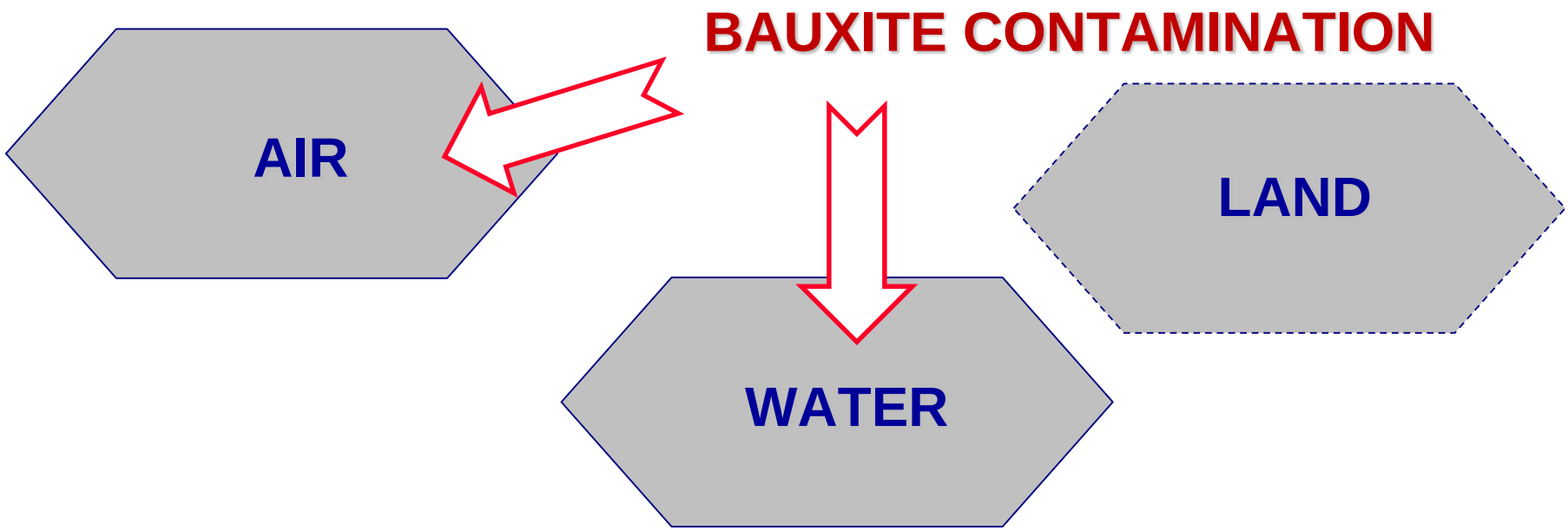
Bauxite residues are also recycled as an input to cement production, refractories, soil amelioration and landfill covering.

Note: Australia for instance goes to great lengths to promote sustainable bauxite mining to not only ensure the mines are later rehabilitated but also to prevent the side impacts. This is because, like most ores and soils, bauxite can contain trace quantities of metals such as arsenic, beryllium, cadmium, chromium, lead, manganese, mercury, nickel and naturally-occurring radioactive materials, such as thorium and uranium. Most of these trace elements remain with the residue after extraction of the alumina.

Source : Australian Aluminium Council/The International Aluminium Institute

ENVIRONMENTAL ISSUES

- Unregulated and rampant open-cast bauxite mining activities in Kuantan, Pahang has led to severe air and watercourse pollution during a period of about 18 months. Kuantan was termed “Mars on earth" as red dust and red water flows in the capital state of Pahang.



ENVIRONMENTAL ISSUES

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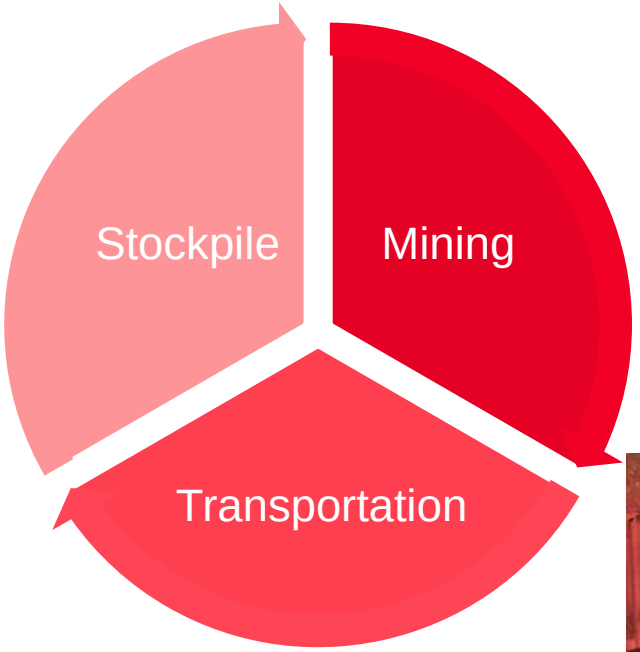

ENVIRONMENTAL ISSUES

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- Reports on high heavy metals (i.e. aluminium, arsenic, lead, iron) in contaminated rivers and treated water

- Speculations on radioactive material in water and sediments

ENVIRONMENTAL ISSUES

BAUXITE CONTAMINATION

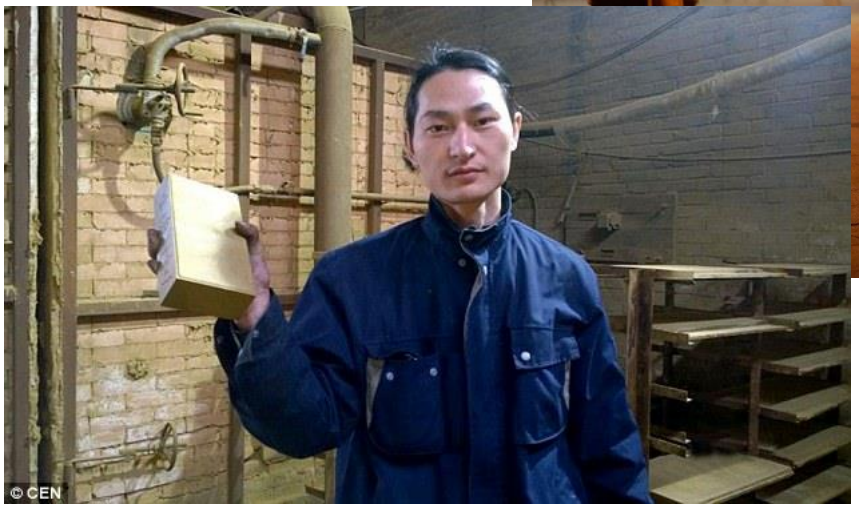
STOP MORATORIUM

ENVIRONMENTAL ISSUES

BAUXITE CONTAMINATION

ENVIRONMENTAL SOLUTIONS

BAUXITE CONTAMINATION



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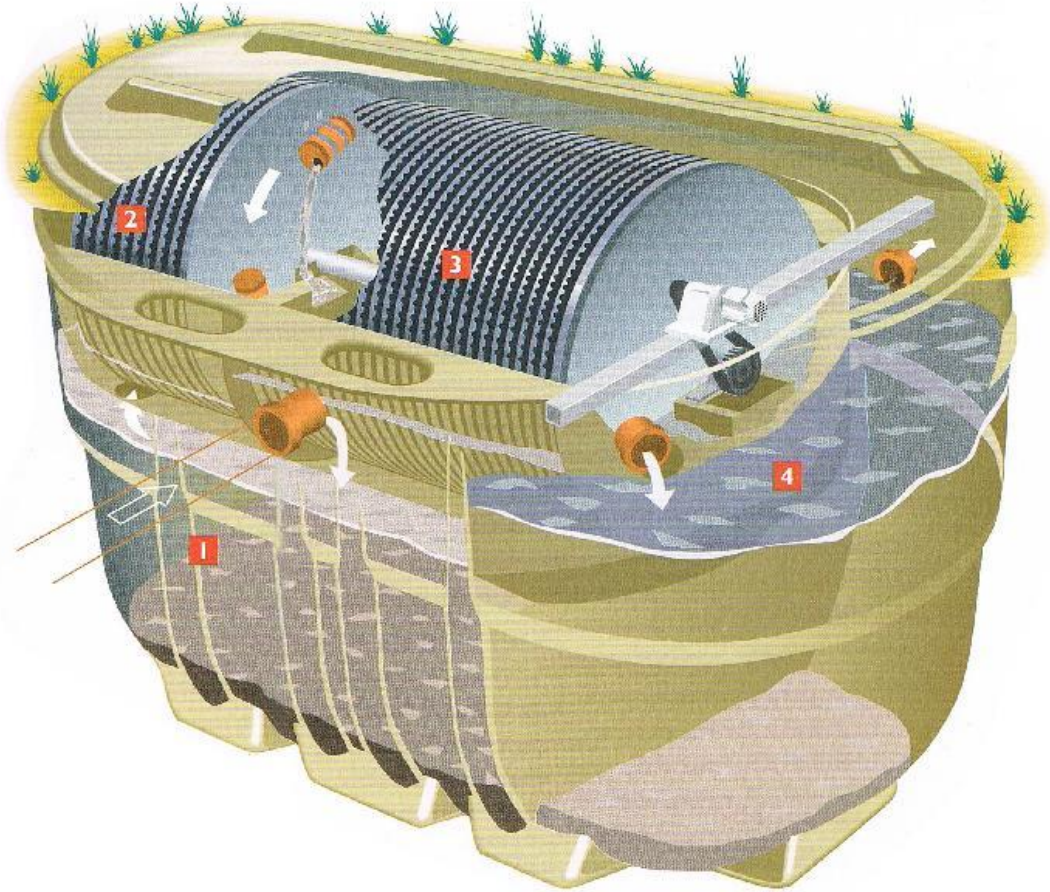

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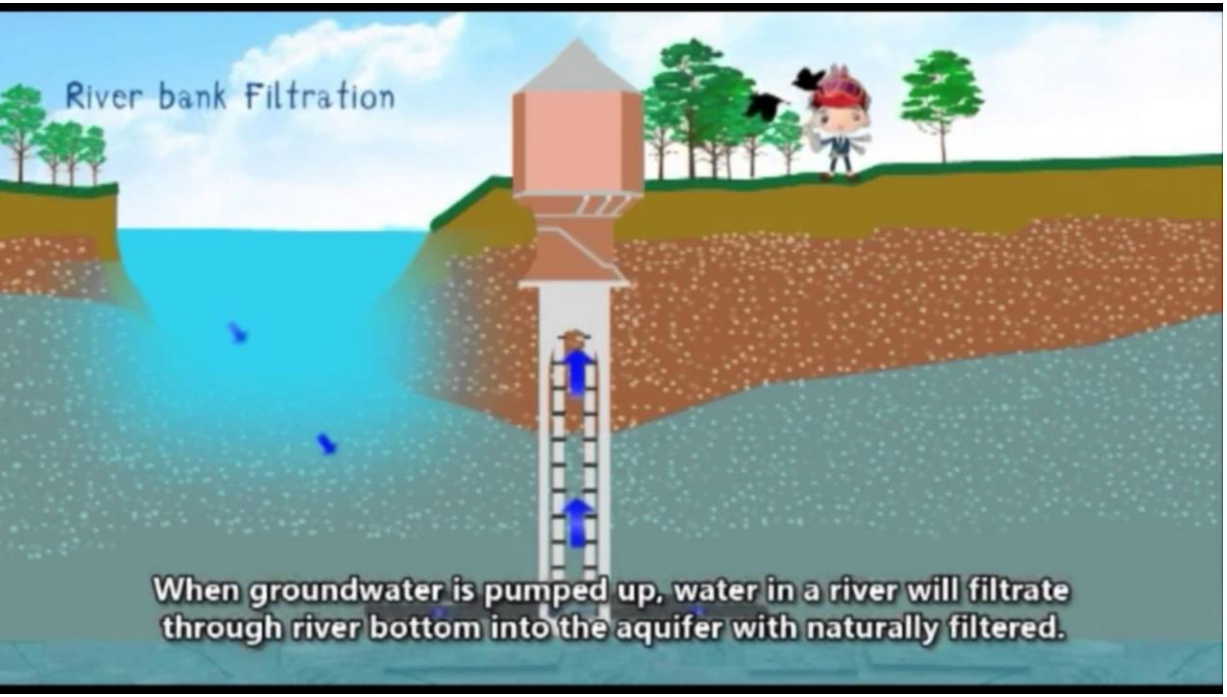

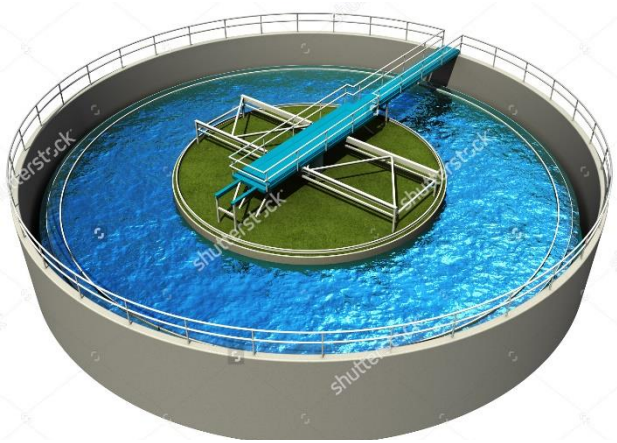

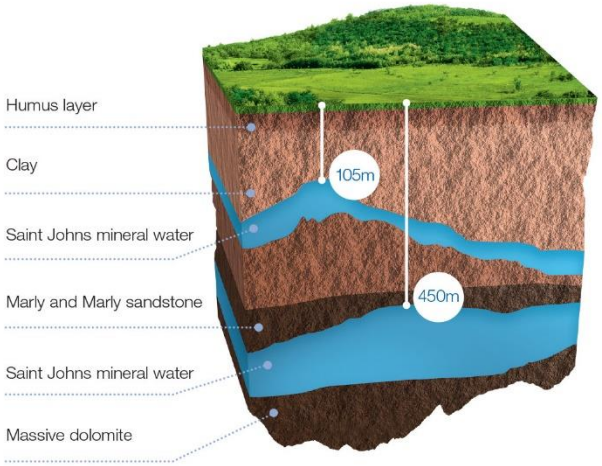

CONCLUSION

- BAUXITE IS A BOON, GENERATE ECONOMY AND PROMOTE BUSINESSES FOR THE STATE OF PAHANG
- MORATORIUM IMPOSED WOULD JEOPARDISE THE INDUSTRY
- STRICT MONITORING & REGULATIONS SHOULD BE IMPOSED
- IMPACT OF AIR & WATER POLLUTION DUE TO BAUXITE MINING CAN BE MINIMISED

~ ThANk yOU ~