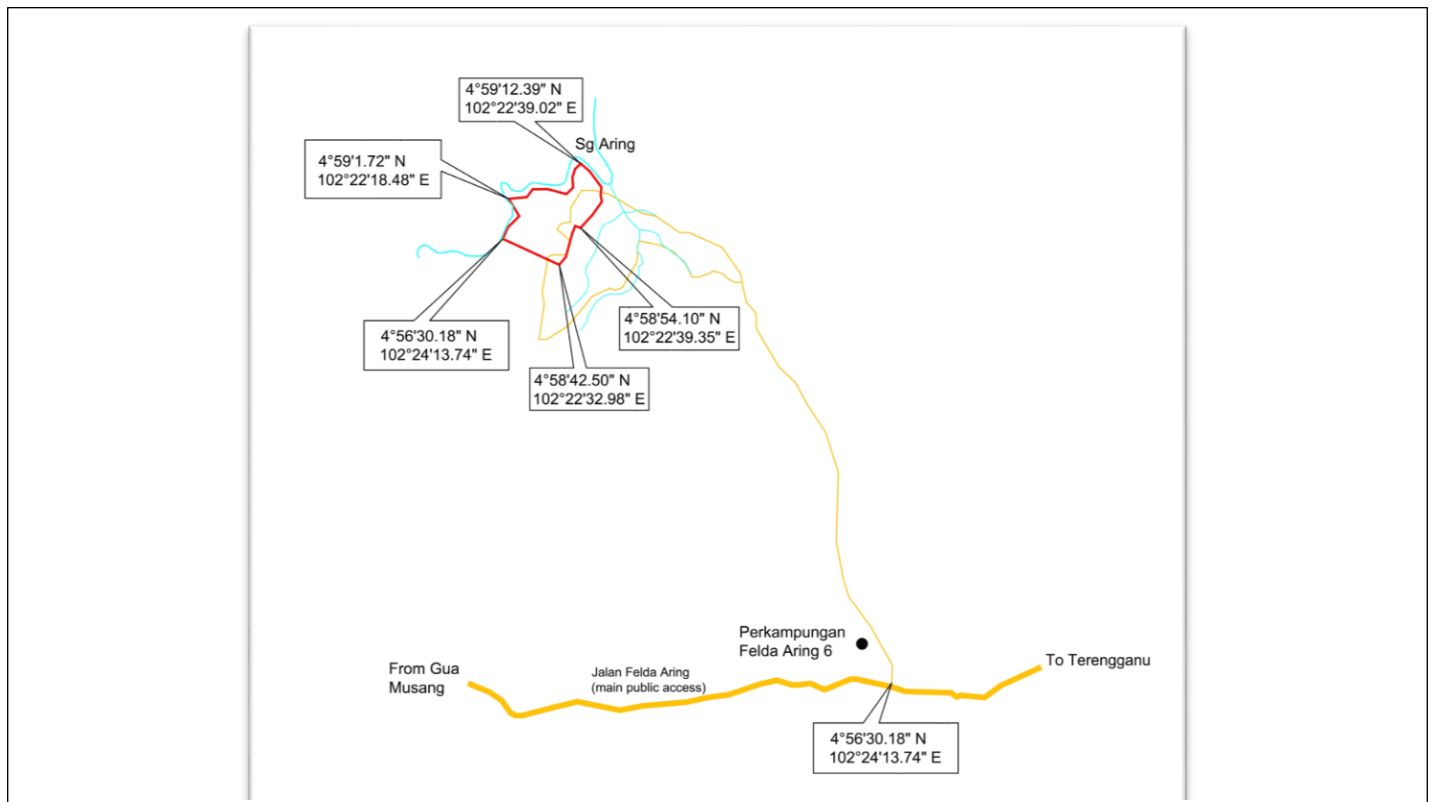


# MANGANESE MINING OPERATION ON PT 11202 MEASURING AN AREA OF 40.48HA (100.0 ACRES) AT MUKIM RELAI, DAERAH CHIKU, JAJAHAN GUA MUSANG, KELANTAN DARUL NAIM

## EXECUTIVE SUMMARY

The proposed project site is an existing oil palm plantation estate. The project aims to extract manganese ore and process it into various sizes of ores ready for sales to cater demand of downstream industry. The project site can be accessed via Jalan Felda Aring. The current site is zoned under "Hutan", as confirmed by the PLANMalaysia@Kelantan. However, the project site is allowed for mining with specific conditions.



### PROJECT PROPONENT

**Sebanjar Bina Sdn Bhd (569296-A)**

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### EIA CONSULTANT

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## PROJECT DESCRIPTION



**Type of mineral:**  
Manganese



**Mining method :** Dry opencast



**Life span :** 7 years



**Location :**

4°59'2.22'N and 102°22'31.28'E



**Project activities :**

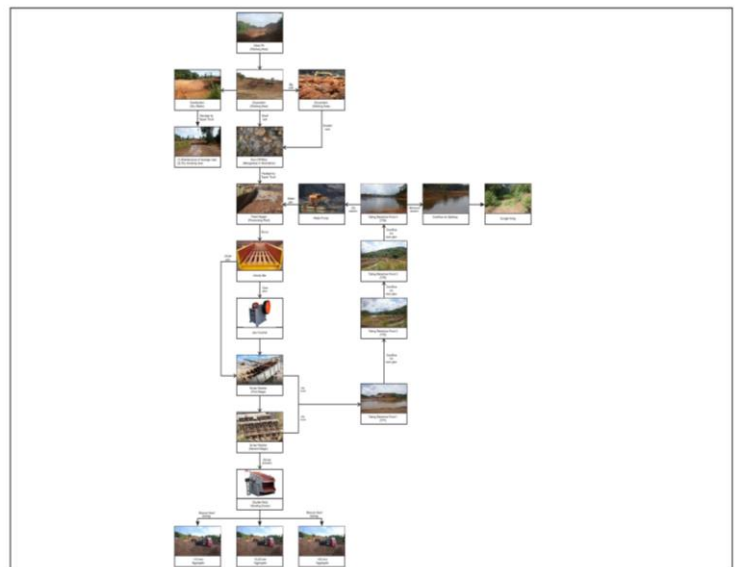
### Operation Stage

- Mine ore excavation
- Haulage operation
- Processing operation
- Stockpiling
- Dry dumping/tailing management
- Sales
- Road maintenance
- Sedimentation pond maintenance
- Waste management

### Abandonment Stage

- Progressive rehabilitation
- Final rehabilitation and reclamation

- The project site is sited next to Sg Aring.
- Aras Kuasa Sdn Bhd, Nadi KW Sdn Bhd, Alam Tasik Mining Sdn Bhd, Gigantec Mining Sdn Bhd and Gainblend (M) Sdn Bhd are within 5km radius.



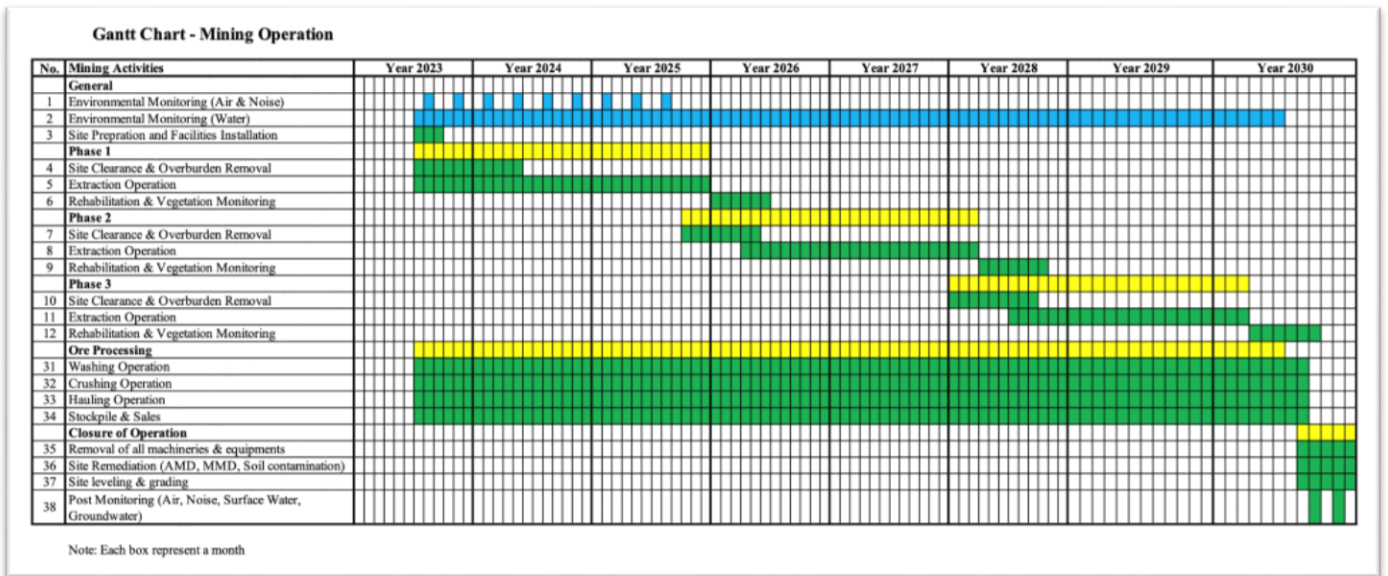
**Process Flow Chart**

## NEED FOR PROJECT



High demand in local market and China market

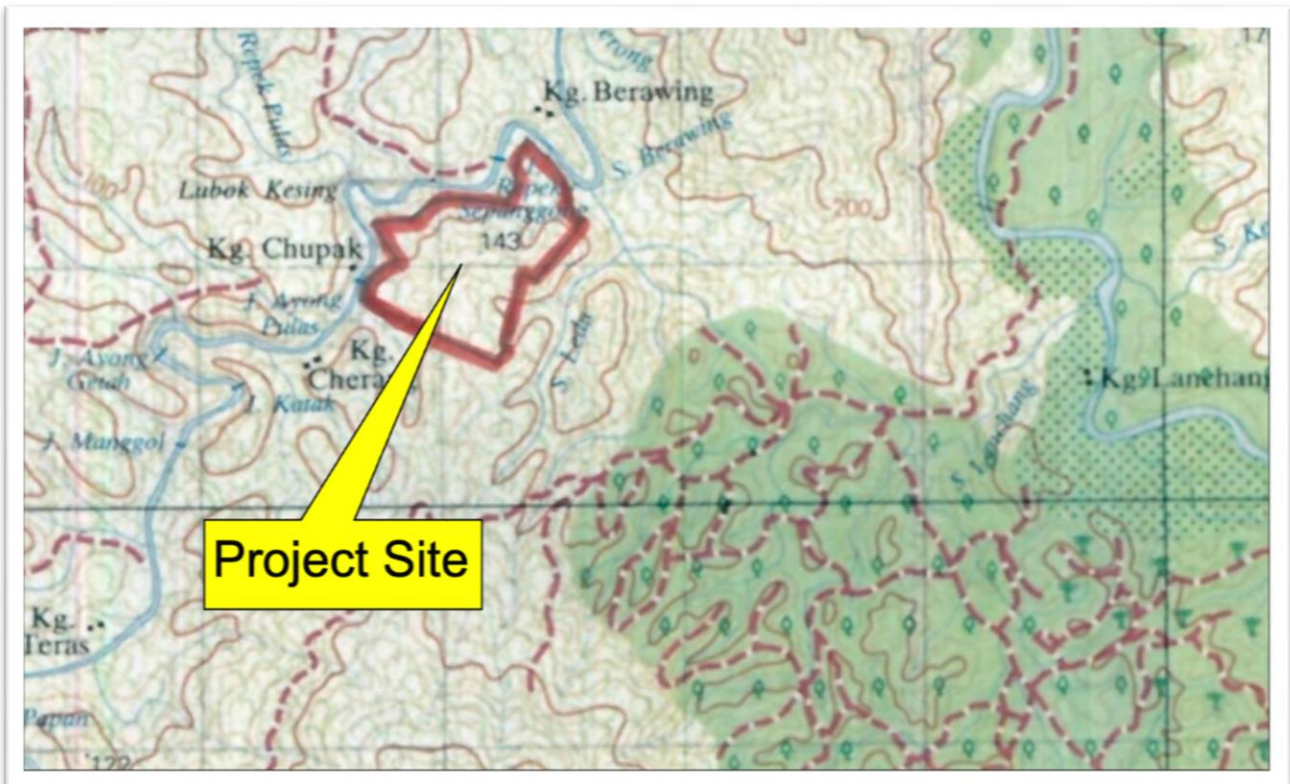
# PROJECT TIMELINE



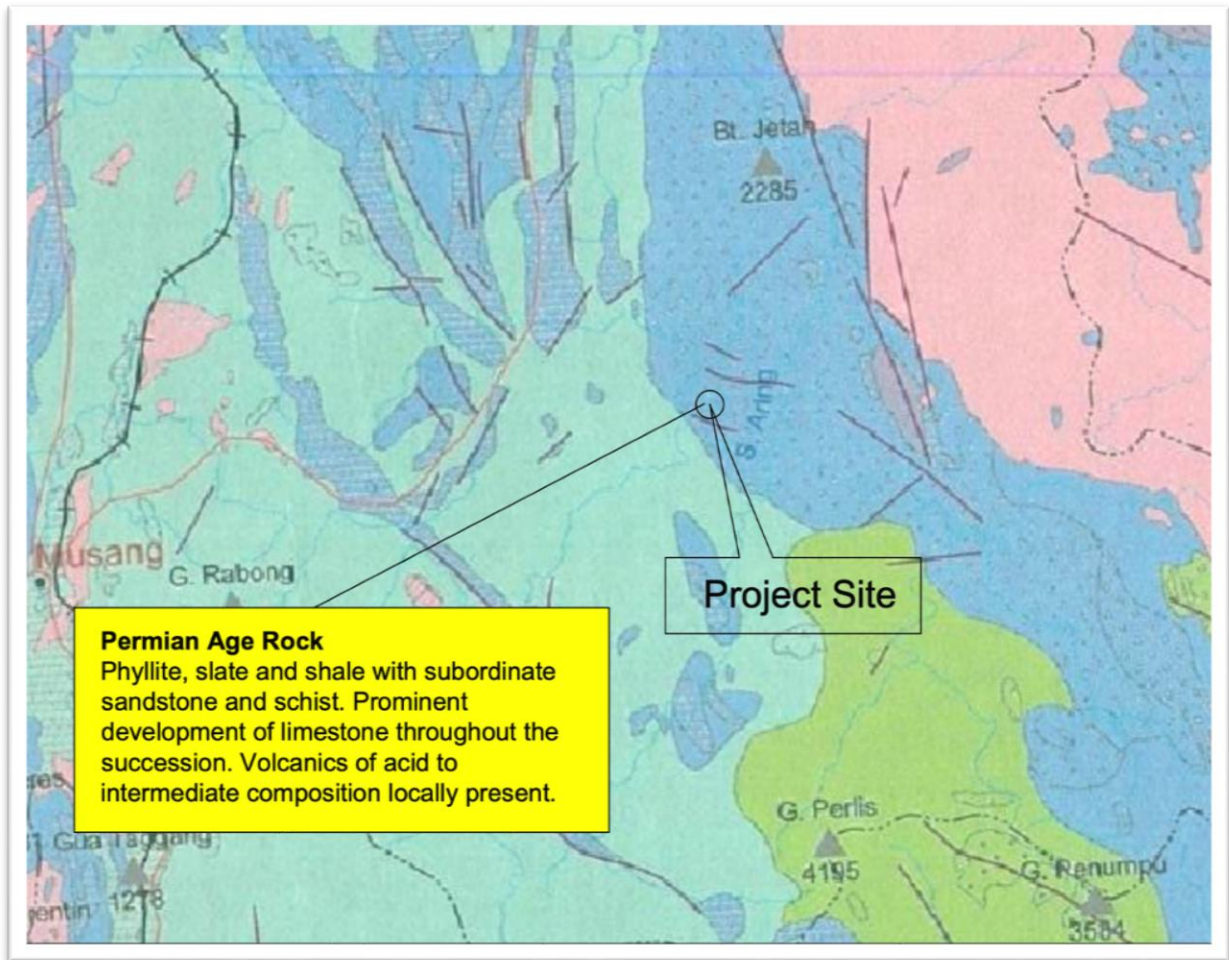
## PHYSICAL ENVIRONMENT

### Topography

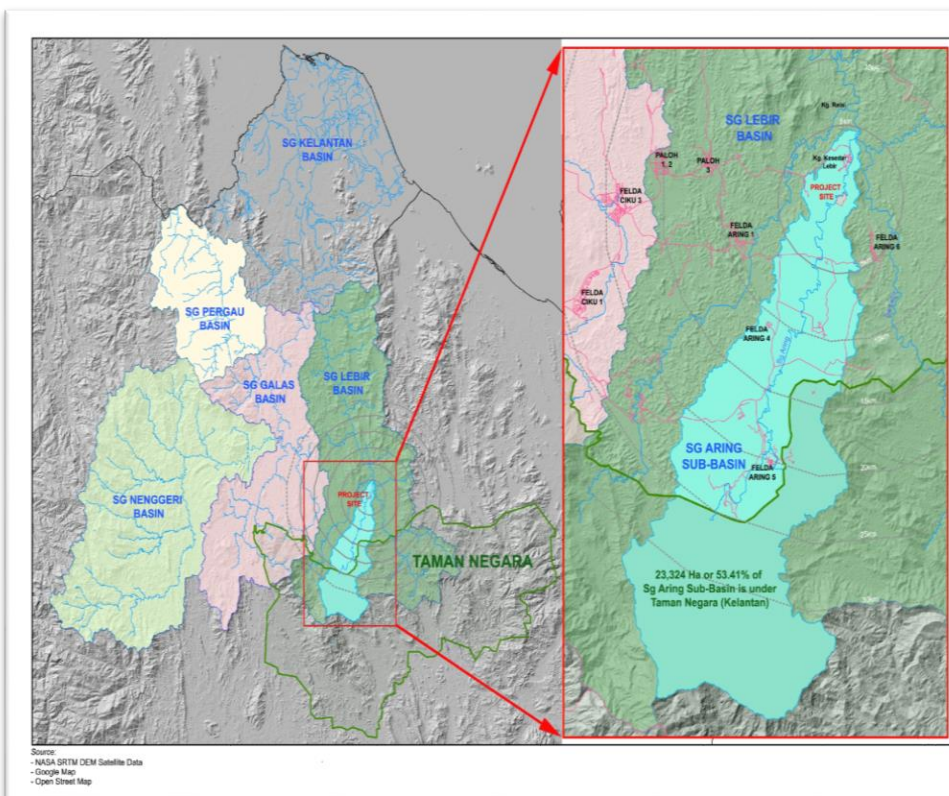
- Undulation rising from 70m to 125m above mean sea level



## Geology

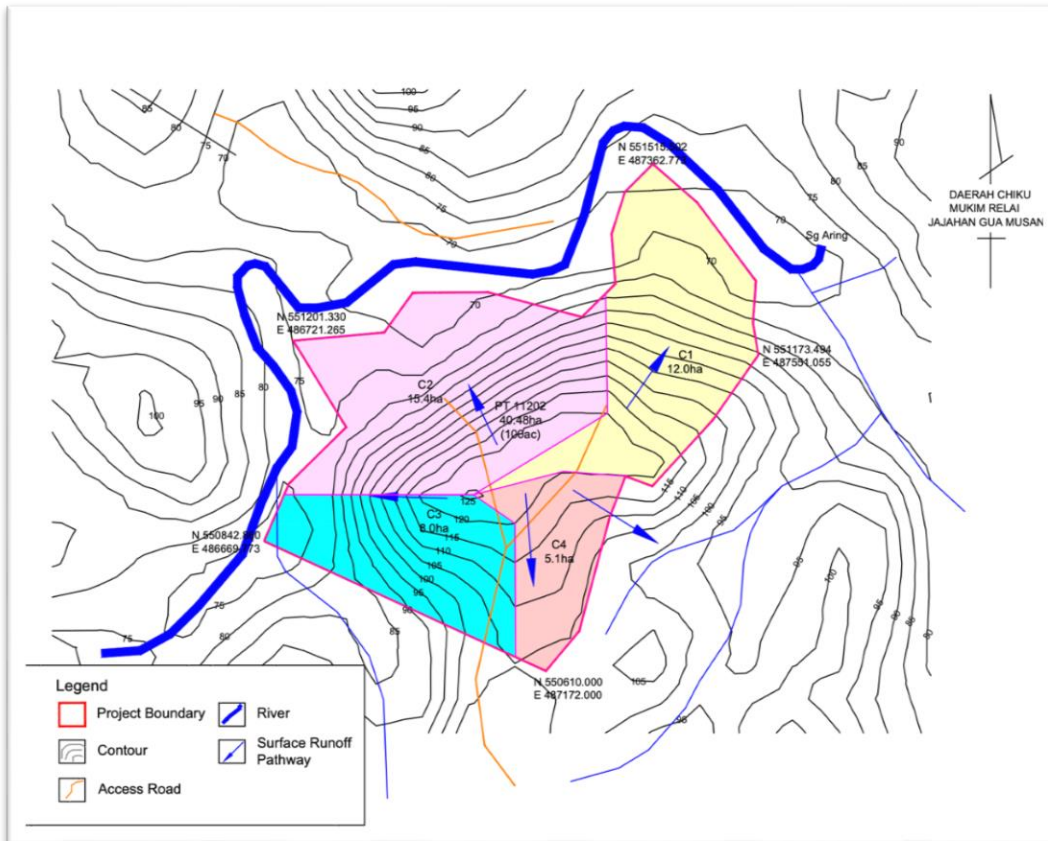


## Hydrology



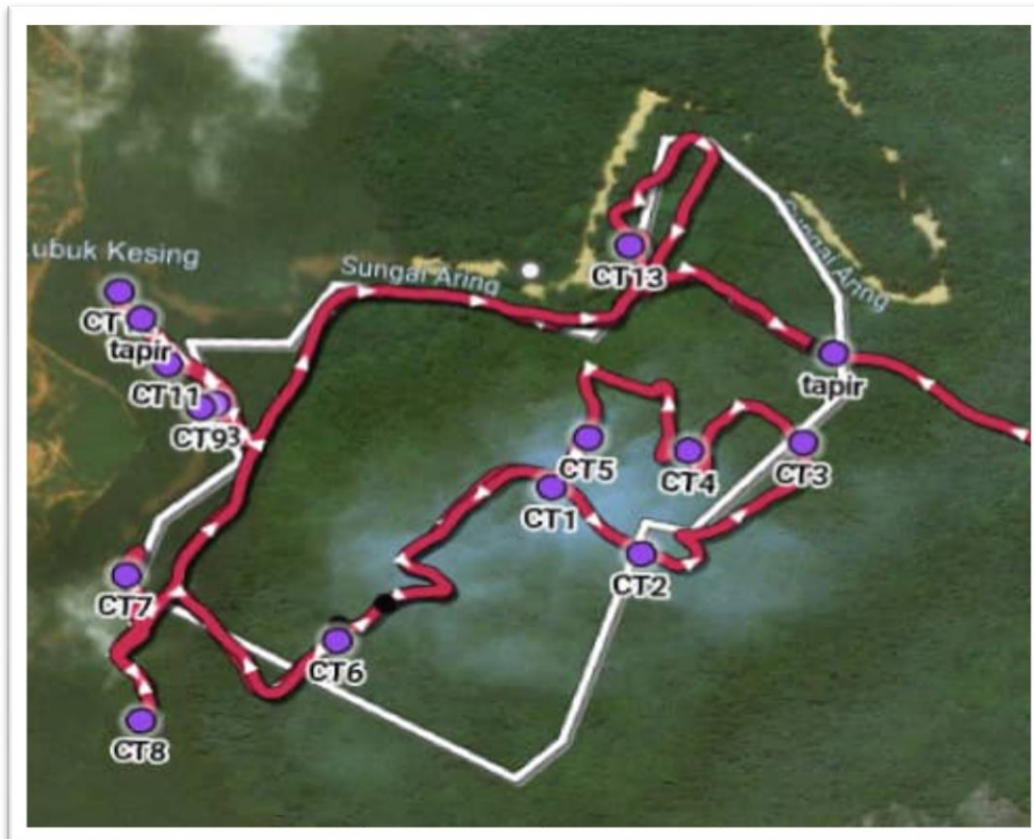
- **Sg Aring** is sited next to the project site.
- Sg Aring flows into Sg Lebir and consequently flows into Sg Kelantan and finally open sea
- There are water treatment plants at the downstream of project site

## Catchment Delineation



- There are four (4) catchment areas (C1, C2, C3 and C4)
- Surface runoff in C1, C2 and C3 will flow into Sg Aring naturally.
- Surface runoff in C4 will flow into Sg Leda, tributary of Sg Aring

## Fauna Camera Trap

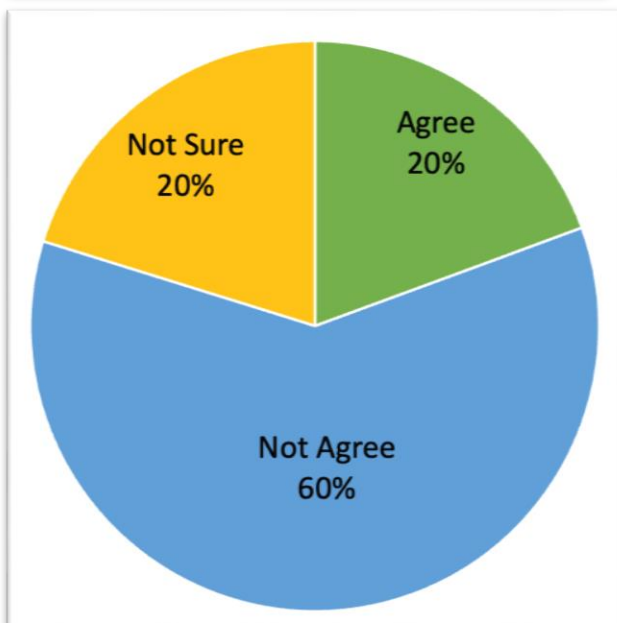


## SOCIO-ECONOMICS

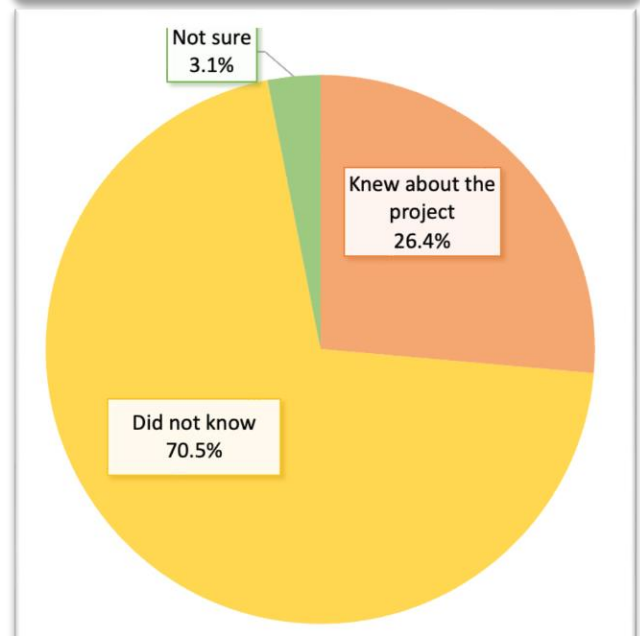
### Distribution of Respondents

Kampung Kesedar Lebir	94
Kampung Felda Aring 6	35
<b>Amount</b>	<b>129</b>

### Public Acceptance



### Project Awareness



### Perception of Project Benefits

- Job opportunities.
- Good for local economy and state development
- To adhere to planning and not abandoning the mines

### Perception of Socioeconomic Issues

- Decreased quality of life, disturbance of tranquility, noise, water and air pollution.
- Affecting access road in Aring 6 & public safety

# ENVIRONMENT BASELINE QUALITY

## Water Quality



### 6 Monitoring Locations

- The parameter limits is compared with Class IIA in the National Water Quality Standards for Malaysia and Mineral Development (Effluent) Regulations 2016
- TSS, Mn, Fe and Turbidity are exceeded the class IIA limit for all the samples.
- The WQI is within 65 to 75 and the river status is “slightly polluted”.

## Noise Level



### 3 Monitoring Locations

- Daytime : 60 dBA
- Night Time : 55 dBA
- Only N3 complied with the limit. Vehicur movement at N1 causes it exceeded the limit. While, natural sound are noticed at N2.

## Air Quality



### 3 Monitoring Locations

- Results are compared to Malaysian Ambient Air Quality Standard.
- All comply with allowable limit.

Parameters	Result	Limit
PM10, $\mu\text{g}/\text{m}^3$	19 - 46	100 $\mu\text{g}/\text{m}^3$
PM2.5, $\mu\text{g}/\text{m}^3$	7 – 25	35 $\mu\text{g}/\text{m}^3$
SO <sub>2</sub> , $\mu\text{g}/\text{m}^3$	< 5	80 $\mu\text{g}/\text{m}^3$
NO <sub>2</sub> , $\mu\text{g}/\text{m}^3$	< 0.5	280 $\mu\text{g}/\text{m}^3$
CO, $\text{mg}/\text{m}^3$	1 – 2.4	10 $\mu\text{g}/\text{m}^3$
O <sub>3</sub> , $\mu\text{g}/\text{m}^3$	< 5	100 $\mu\text{g}/\text{m}^3$

## Terrestrial Fauna



### 15 Camera Traps

- 22 bird families, 38 Bird spp, 13 Mammal spp.
- IUCN Near Threatened – Green Iora, Lesser Green Leafbird, Scarlet-numped Trogon and Silvered Leaf Monkey
- IUCN Endangered – Asian Elephant and Malayan Tapir

## Terrestrial Flora



- The project site is occupied by oil palm trees in Felda Aring 6
- 75 spp, 34 families
- The highest family with number of species is Poaceae represented by nine species, followed by Compositae, Leguminosae and Rubiaceae with six species each

## POTENTIAL IMPACT : AIR QUALITY

**ACTIVITIES** : Site Clearing, Loosen Overburden Stockpile, Construction Of Access Road, Vehicular Movement, Removal of Site Facilities, Levelling , Grading and Adding Topsoil

### IMPACTS

- Dust generation and dispersion.
- Sensitive receptors more prone to negative health impact.

### MITIGATION MEASURES

- Cover the crushers and screen house.
- Reservation of existing vegetation and tree.
- Cleared vegetation and trees parts (biomass) shall be stored.
- No open burning.
- Cover the exposed slopes.
- Set speed limit of trucks.
- Water browsing truck shall be available.

## POTENTIAL IMPACT : NOISE POLLUTION

**ACTIVITIES** : Vehicular Movement, Processing Plant, Dismantle Site Facilities and Traffic Noise

**SENSITIVE RECEPTOR** : Kg Kesedar Lebir, Kg Felda Aring 6

### IMPACT

- Impact hearing & can cause mental nuisance.
- Disturb the tranquillity of the local area and nearby residents.

### MITIGATION MEASURES

- Maintain vegetation belt as noise barrier.
- Regular inspection and maintenance of machineries and vehicles.
- Continual monitoring of noise level.
- Comply with OSHA (exposure 90 dBA over 8 hours).
- Set speed limit of trucks to 15 km/hr.
- PPE to be provided for workers.

## POTENTIAL IMPACT : WATER QUALITY

**ACTIVITIES** : Site Clearing, Overburden Stockpile, Cover Top Soil Erosion, Formation of AMD, Land Stability, Washing Plant, Removal of Schedule Waste and Site Levelling.

### IMPACTS

- Visibility of water will drop.
- Potential formation of AMD

- Affect human health & aesthetic appearance.

- Contaminated runoff may intrude into the surrounding drainage system.

### MITIGATION MEASURES

- Cease operation during period of high rainfall
- Handle Scheduled waste properly
- Minimise exposed area
- Continual water quality monitoring

- Minimise exposed area

- Set up relevant BMPs such as earth drain, sediment basin .
- Regular maintenance on BMPs
- Minimise exposed area.
- Stabilize loss soil structure.
- Buffer zone to be set up surrounding the project site.

## POTENTIAL IMPACT : GROUNDWATER QUALITY

**ACTIVITIES** : Site Clearing, Overburden Stockpile, Ore Extraction and Tailing Ponds

### IMPACTS

- Potential change in groundwater levels and flow.
- Potential groundwater contamination and contaminant movement

### MITIGATION MEASURES

- Groundwater monitoring wells to be set up
- Mining operation in phases
- Backfilling of the excavated area once operation is completed
- Continual groundwater quality monitoring

## POTENTIAL IMPACT : SOIL EROSION & SEDIMENTATION

**ACTIVITIES** : Ore Extraction, Side Bank of Earth Drain & Sediment Basin, Dry Dumping, Tailing Waste Storage and Exposed Earth Area.

### IMPACTS

- Water quality & aesthetic value degradation.

- Soil erosion & sedimentation

### MITIGATION MEASURES

- Regular maintenance on BMPs and tailing ponds
- Cross drains, sumps and side ditches are recommended.
- Sediment basin outlet protection is proposed .
- Installation of check dam.

- Use cut biomass (branches, leaves and roots) as protection barrier.
- Use existing roads. reconstruct only to the extent necessary to provide adequate drainage.

## POTENTIAL IMPACT : SLOPE STABILITY

**ACTIVITIES** : Ore Extraction

### IMPACTS

- Risk of slope stability.
- Impact safety of human and animals.

### MITIGATION MEASURES

- Bench shall have suitable height
- Slope shall be adequately drained to allow water flow.
- Any hanging wall shall be removed as soon as possible.
- Regular inspection on slope.
- Slope maintenance shall regularly be done and slope failure shall be repaired to avoid further failure.

# POTENTIAL IMPACT : SOLID & SCHEDULED WASTE MANAGEMENT

**ACTIVITIES** : Illegal Management of Solid and Hazardous Waste

## IMPACTS

- Water degradation and pollution.

- Soil contamination.

- Fuel oil spillage.

## MITIGATION MEASURES

- Project proponent shall bear the full responsibility if there is leakage of scheduled waste to nearby stream.
- Fuel storage in dumps is set back 30 meter from any water body and located on relatively flat land.

- General solid waste shall be stored in the designated bin.
- Recycling and reuse of used material are recommended.
- Scheduled waste must be labelled and stored according to **ENVIRONMENTAL QUALITY (SCHEDULED WASTES) REGULATIONS 2005.**
- All containers, full or empty is handled with care.

- The storage area shall have bund to provide containment capacity of 110% of the largest volume of drum.
- Warning sign board shall be placed.
- Transportation and storage of fuel and lubricants is in properly constructed containers of an approved design.
- Refueling activities is not be conducted nearby watercourses or on-site drainage channels.

## POTENTIAL IMPACT : TRAFFIC & TRANSPORTATION

**ACTIVITIES** : Transportation of Ore, Hauling/Excavated Material to the Processing Plant

### IMPACTS

- Traffic congestion
- Wildlife roadkill

- Spread of dirt on public road

### MITIGATION MEASURES

- Avoid transportation at peak hours
- Install clear speed limit and warning signboard
- Provide paved access road
- Transporting vehicles must not overload

- Wash trough is to be provided
- Road spraying especially during draught

## POTENTIAL IMPACT : OCCUPATIONAL, SAFETY & HEALTH

**ACTIVITIES** : Resource Excavation, Operating of Machineries, Processing Plant and Truck

### IMPACTS

- Risk towards health.

- Accident during operations stage.

- Dispersed of Dust and mineral dust.

### MITIGATION MEASURES

- Ensure no clogged drain or stagnant pond or pool.
- No raw sewage routing into nearby watercourses.
- Increase awareness of the dangers of communicable and vector borne diseases.
- General health insurance for all workforce.
- Conduct Chemical health Risk Assessment (CHRA)

- Use of latest equipment, tools and machinery in the mining operation.

- Ensure the cleanliness of the basecamp and workers.
- Wearing PPE.
- Periodical medical check up of on site workers on the accumulation of bauxite toxicants.

## POTENTIAL IMPACT : TERRESTRIAL FLORA & FAUNA

**ACTIVITIES :** Land Clearing

### IMPACTS

- Loss of habitat for flora

- Wildlife Conflict
- Potential loss of food

### MITIGATION MEASURES

- Fill mining pit and tailing ponds with overburden.
- Replant bare and exposed slope shall be immediately.
- Operator will engage consultant for the rehabilitation works for brownfield remediation.

- No hunting of wildlife.
- Cage Trapping of endangered and vulnerable species.
- Provide migratory corridor.
- Report to the nearest Jabatan PERHILITAN if there is conflict.
- Project proponent must aware of the "Total Protection" species.

## POTENTIAL IMPACT : SOCIO ECONOMY

**ACTIVITIES :** Transport Ore and Clearance Vegetation

### IMPACTS

- Job Opportunities

- Public safety & healthy

- Affect cultural and aesthetic value

- Dust and noise disturbance

### MITIGATION MEASURES

- Employing local workers as part of the workforce
- Local contractors and subcontractors will be recommended

- Keep and maintain records of any transportation accident for further planning of prevention measures
- Operator should be sensitive to nearby stakeholders.
- Install clear speed limit and warning signs beside nearby the public road.

- Beautify the visuals with appropriate landscaping and replanting of trees.

- Water browser and wash trough should be provided

# PROPOSED ENVIRONMENTAL MONITORING PROGRAMME

## Rehabilitation Program

- Filling all the mining pits and Tailing Pond (TL)
- Dismantling all machinery onsite, mobile and immobile structures, closing all inlet and outlet of sediment basins, remove all source of toxic and hazardous substances, testing contaminants, if any on the surface soil in areas where diesel, oil, lubricants and hydraulic fuel stored.
- Ensure top soil preservation and provision of organic manure for future planting, landscaping and afforestation exercise.
- Make the terrain as green as possible with trees, plants, grass with natural drainage as free flowing as previous existing condition.
- Involve nearby Orang Asli in rehab work and provide them with jobs as important stakeholder. It is to understand they are the owner and custodian of the heritage for centuries.

## Rehabilitation Works

- Initial reclamation which includes removal of all equipment and heavy machineries, washing plant, crushers, conveyor belts, excavators, shower, electric installations, lorries, skid tank and other fixed structures. This will be undertaken by licensed removal specialists.
- The site will be free from any traces of schedule wastes, oils, diesels and lubricants. The land forms will be graded into acceptable standard in relation to environmental criteria.
- Progressive rehabilitation while the mining in progress, such as, landscaping works at main access and other important location within site along with planting, sowing will be in progress without waiting of cessation of operation.
- Starting filling the mining pit for use by draining the storm water runoff. It might be anticipated to take years to fill the mine. However, it depends on rainfall totals.

## Post Operation Stage

- A detailed 'Ecological and Soil Mapping' of the existing degraded site.
- Existing plants and trees at the edge and buffer zone will be listed out as inventory as part of ecological restoration planning.
- Identification and preparation of inventory of plants, medium trees and creepers suitable for site restoration. Identification of types of overburden/top soil suitable for green and buffer of the all existing slopes and gradients. The volume of top soil/overburden will be estimated to cover all the exposed benches. Its location and distance need to be calculated. Currently, however, there are unused top soil/overburden along the site that will be transported to exposed benches to cover the earth crust made of solid granitic rock. Besides, the tailing wastes will be used to backfill the mining pit.
- Existing drainage will be studied to ensure all runoffs are detained and channeled properly.
- The water quality of the final discharge in terms of any contaminating capability therein to adjoining water courses.
- Study of soiled sites, e.g., skid tank area, scheduled wastes sites and out plan for physical/chemical treatment.
- Perimeter drain, earth drain, final drain and proper 'Sediment Pond' will be functioning till the closure of mining operation.

## PROJECT PROPONENT

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