

Ore Processing Outside Tenement Area, including Concentrating of Gold on Lot PT 5312, with an area of 19.5 hectares in Mukim Gemencheh, District of Tampin, Negeri Sembilan Darul Khusus

EXECUTIVE SUMMARY

The proposed project site, surrounded by rubber and oil palm plantations, is intended for the processing of gold ore for downstream industries. Accessibility is via the Lebuhraya Utara–Selatan through Simpang Ampat, continuing along Simpang Ampang and Jalan Nyalas to Gemencheh Township. The site is zoned as “industry” under the Land Title, while under the Rancangan Struktur Negeri Sembilan 2045 and Rancangan Tempatan Daerah Tampin 2035 it is designated as “pertanian”.



PROJECT PROPONENT

Air Kuning Resources Sdn. Bhd.

Kediaman Rasmi, Balai Undang Luak Johol
73100 Johol, Negeri Sembilan Darul Khusus
Tel: 019-681 5533

EIA CONSULTANT

MSK & Associates Sdn. Bhd.

32A-3A, Jalan PJU 1/3A,
Sunwaymas Commercial Centre
47301 Petaling Jaya, Selangor Darul Ehsan.
Tel: 03 – 7804 0556
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PROJECT DESCRIPTION



Type of mineral: Gold ore



Location:

2°32'55.15"N and 102°29'3.79"E



Life span: 5 years



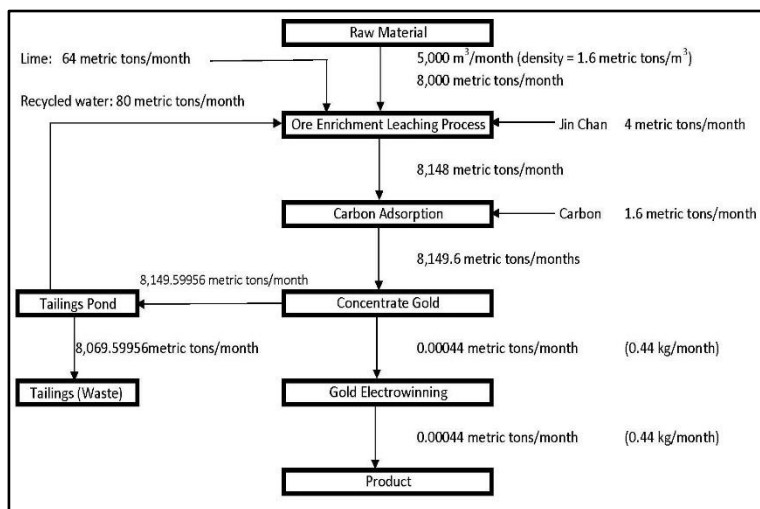
Project activities:

Operation Stage

- Haulage operation
- Processing operation
- Stockpiling
- Dry dumping/tailing management
- Sales
- Sedimentation pond maintenance
- Waste management

Abandonment Stage

- Progressive rehabilitation
- Final rehabilitation



Process Flow Chart

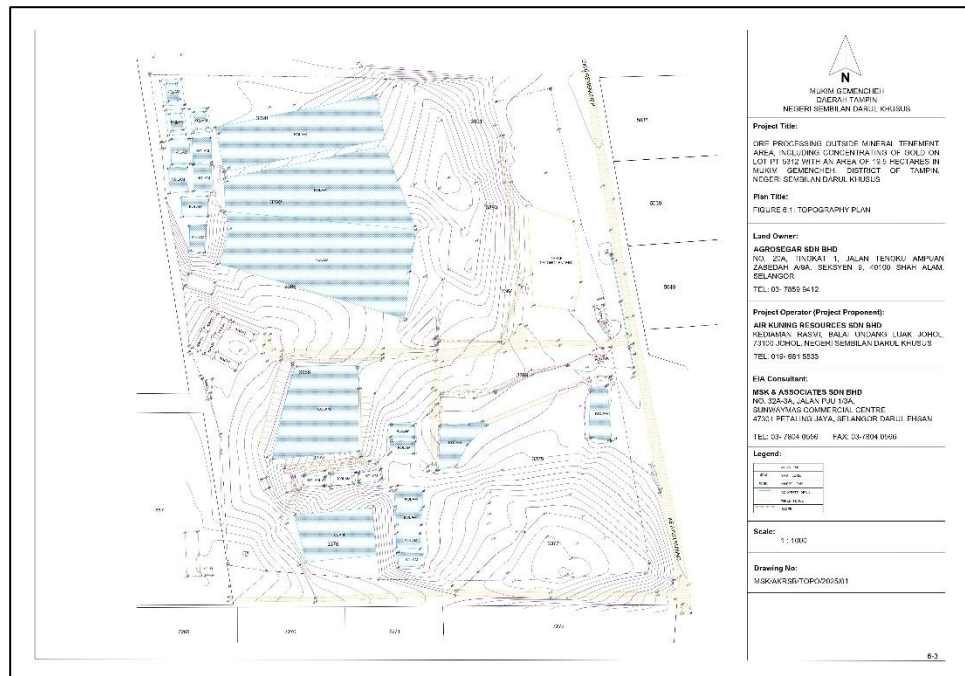
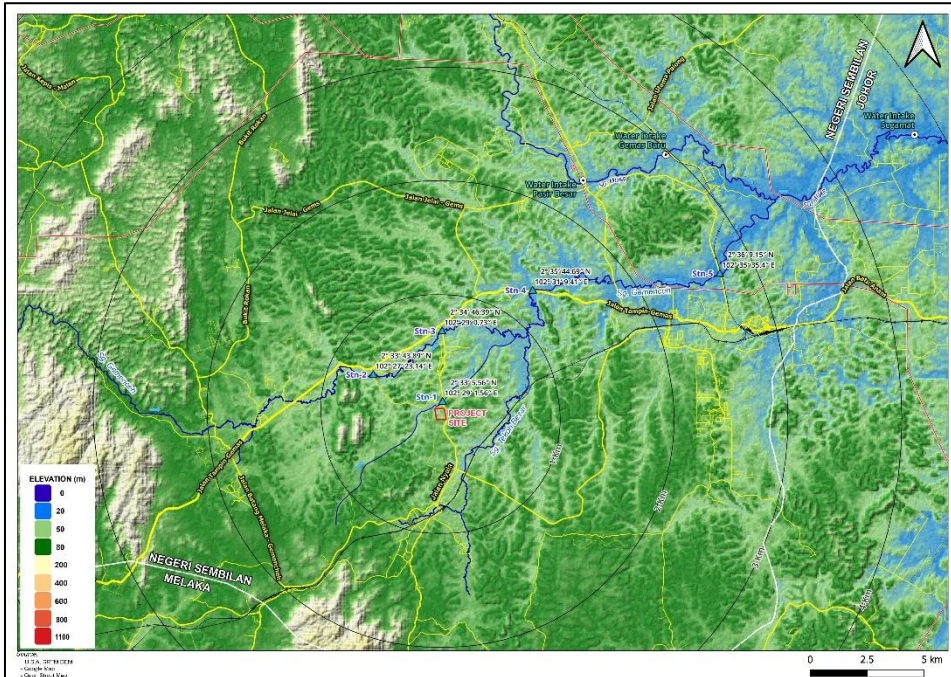
NEED FOR PROJECT



The proposed gold ore processing project is driven by sustained demand for gold and its contribution to national economic growth.

PHYSICAL ENVIRONMENT

Topography

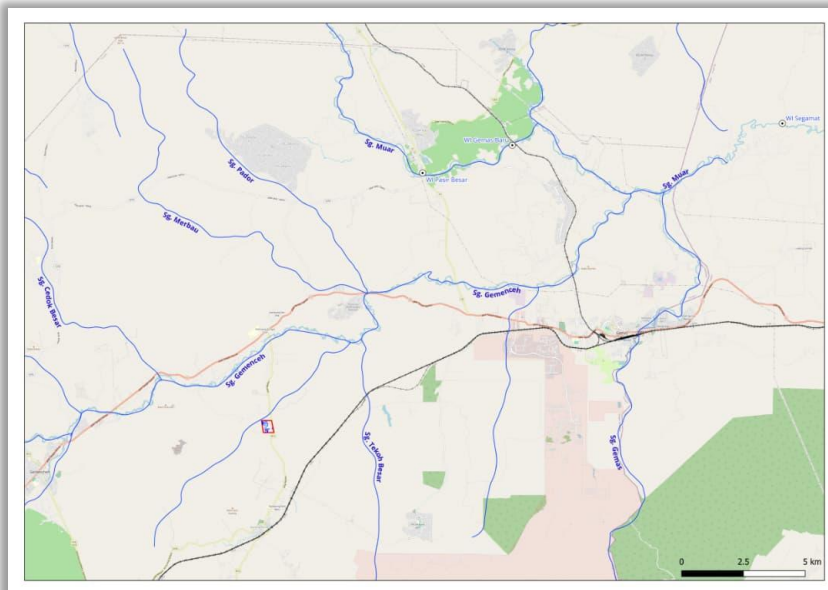


- undulation rising from as low as 20 m to as high as 40 m above mean sea level (MSL).
- The proposed site was characterised by gently undulating lowland terrain.

Geology

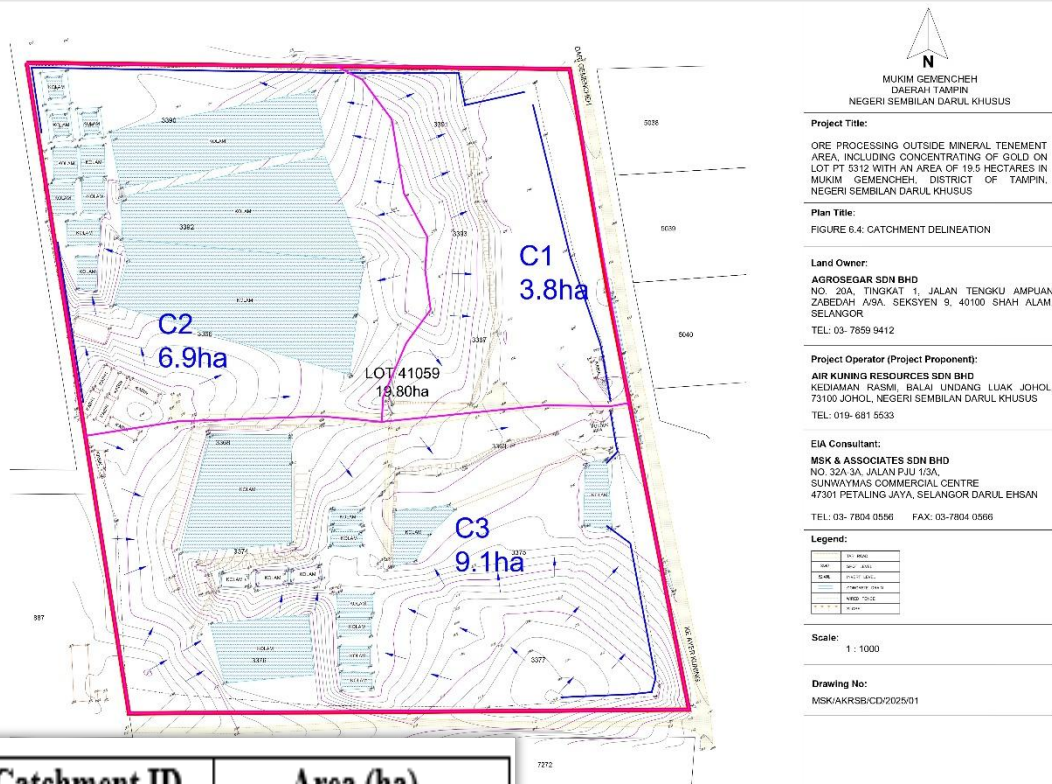
- The project site area is characterised by a geological setting dominated by granite intrusions and Palaeozoic sedimentary rocks, with clear evidence of contact metamorphism (Jabatan Mineral dan Geosains Malaysia, 2004). The predominant soil association within the site comprises Gajah Mati–Munchong–Melaka soils, which have developed from the prolonged weathering of granitic and sedimentary parent materials.

Hydrology



- Surface runoff from the project site will flow towards the north direction into Sungai Gemenchah, then Sungai Muar and finally into the Straits of Malacca.

Catchment Delineation



Catchment ID	Area (ha)
C1	3.7
C2	6.8
C3	9.0

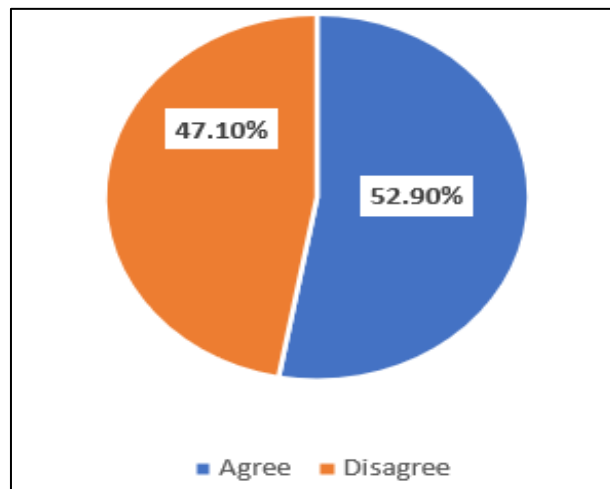
- There are three (3) catchment areas (C1, C2 and C3)
- All the surface runoffs will be channelled naturally into a nearby sediment basin and flow into Sungai Gemencheh via a designed discharge outlet.

SOCIO-ECONOMICS

Distribution of Respondents

No.	Category	Residential	Count
1	Kampung	Kg Parit Buloh	50
2		Kg Sungai Dua	45
3		Kg Tenai (Hilir, Tengah) / Kg. Tenai Ayer Gelugor	36
4		Kg Ayer Gelugor	32
5		Kg Gedok	29
6		Kg Pajak	30
7		Kg Bahru	27
8		Kg Ayer Kuning	16
9	Taman Perumahan	Taman Sri Ayer Kuning	10
10		Taman Semarak 2	10
11		Taman Semarak Fasa 2	10
12		Taman Air Kuning	10
13	Institusi / Penanda	SMK Ayer Kuning	1
14		SMK Bukit Jalor	1
15		SJK(C) Ayer Kuning Selatan	1
JUMLAH			308

Public Acceptance



Perception of Project Benefits

- Job opportunities
- Good for the local economy and state development
- Processing plant location is far from residential areas

ENVIRONMENT BASELINE QUALITY

Water Quality



5 Monitoring Locations

- The parameter limits are compared with Class III in the National Water Quality Standards for Malaysia
- Lead, BOD, COD and Dissolved Oxygen exceed the class III limit for the majority of the samples.
- The WQI is within 65 to 81, and the river status is “slightly polluted”.

Noise Level



3 Monitoring Locations

- Daytime: 65 dBA
- Night Time: 60 dBA
- All samples (N1, N2, and N3) complied with the limit of 65 dBA during daytime and 60 dBA at night.

Air Quality



3 Monitoring Locations

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

Parameters	Result	Limit
PM10, $\mu\text{g}/\text{m}^3$	43 - 55	100 $\mu\text{g}/\text{m}^3$
PM2.5, $\mu\text{g}/\text{m}^3$	17 - 21	35 $\mu\text{g}/\text{m}^3$
SO ₂ , $\mu\text{g}/\text{m}^3$	< 5	80 $\mu\text{g}/\text{m}^3$
NO ₂ , $\mu\text{g}/\text{m}^3$	< 0.5	280 $\mu\text{g}/\text{m}^3$
CO, mg/m^3	<0.5	10 $\mu\text{g}/\text{m}^3$
O ₃ , $\mu\text{g}/\text{m}^3$	< 1.0	100 $\mu\text{g}/\text{m}^3$

Terrestrial Fauna



- 13 bird families, 3 Mammal spp.

Terrestrial Flora



- The project site is surrounded by rubber and oil palm plantation
- Dominance of ferns, such as *Nephrolepis* sp., *Stenochlaena* sp., *Asystasia* sp. and *Euphorbia hirta* were listed. The wild banana, *Musa gracilis* and the wild ginger *Zingiber* sp. are particularly common in the deeper parts of the proposed site.
- Along the edges of the plantations, secondary vegetation predominates. They include tree and shrub species such as *Clerodendron* sp. *Eurya acuminate*, *Ficus* sp. *Macaranga* sp. and *Melastoma* sp.

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

- Reservation of existing vegetation and trees.
- Cleared vegetation and tree parts (biomass) shall be stored.
- No open burning.
- Cover the exposed slopes.
- Set speed limit for trucks.
- Water browsing truck shall be available.
- Provision of a wash trough.
- Visual inspection shall be conducted.

POTENTIAL IMPACT: NOISE POLLUTION

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

SENSITIVE RECEPTOR: Kampung Sungai Dua, Kampung Parit Buloh, MRSM Gemencheh

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 machinery and vehicles.
- Continual monitoring of noise level.
- Comply with OSHA (exposure 90 dBA over 8 hours).
- Set the 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, Washing Plant, Removal of Schedule Waste and Site Levelling.

IMPACTS

- Water clarity will be reduced.
- 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 an earth drain and, sediment basin.
- Regular maintenance on BMPs
- Minimise exposed area.
- Stabilise lost soil structure.
- Buffer zone to be set up surrounding the project site.

POTENTIAL IMPACT : SOIL EROSION & SEDIMENTATION

ACTIVITIES: 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
- Sediment basin outlet protection is proposed.
- Installation of a check dam.

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

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

- The project proponent shall bear the full responsibility if there is a leakage of scheduled waste to the nearby stream.
- Fuel storage in dumps is set back 30 meters 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 materials are recommended.
- Scheduled waste must be labelled and stored according to **ENVIRONMENTAL QUALITY (SCHEDULED WASTES) REGULATIONS 2005**.
- All containers, full or empty, are handled with care.

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

POTENTIAL IMPACT : TRAFFIC & TRANSPORTATION

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

IMPACTS

- Traffic congestion
- Wildlife roadkill

- Spread of dirt on public road

MITIGATION MEASURES

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

- A wash trough is to be provided
- Road spraying, especially during draught season.

POTENTIAL IMPACT : OCCUPATIONAL, SAFETY & HEALTH

ACTIVITIES: Operating of Machinery, 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 the latest equipment, tools and machinery in the operation.

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

POTENTIAL IMPACT : TERRESTRIAL FLORA & FAUNA

ACTIVITIES: Land Clearing

IMPACTS

- Loss of habitat for flora

- Wildlife Conflict
- Potential loss of food source

MITIGATION MEASURES

- Replant bare and exposed slopes immediately.
- The operator will engage a consultant for the rehabilitation works for brownfield remediation.

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

POTENTIAL IMPACT : SOCIO ECONOMY

ACTIVITIES: Transport Ore and Clearance Vegetation

IMPACTS

- Job Opportunities

- Public safety & health

- 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 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

- Dismantling all machinery onsite, mobile and immobile structures, closing all inlets and outlets of sediment basins, removing all sources of toxic and hazardous substances, testing contaminants, if any, on the surface soil in areas where diesel, oil, lubricants and hydraulic fuel are stored.
- Ensure topsoil preservation and provision of organic manure for future planting, landscaping and afforestation exercises.
- Make the terrain as green as possible with trees, plants, grass, and natural drainage as free-flowing as the previous existing condition.
- Involve nearby locals in rehab work and provide them with jobs as important stakeholders.

Rehabilitation Works

- Initial decommissioning, which includes removal of all equipment and heavy machinery, washing plant, 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 to an acceptable standard in relation to environmental criteria.
- Progressive rehabilitation while the operation is in progress, such as landscaping works at the main access and other important locations within the site, along with planting and sowing, will be in progress without waiting for the cessation of the operation.

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 an inventory of plants, medium trees and creepers suitable for site restoration. Identification of types of overburden/topsoil suitable for green and buffer zones of the existing slopes and gradients. Its location and distance need to be calculated. Currently, however, there is unused topsoil/overburden along the site that will be transported to exposed benches to cover the earth crust made of solid granitic rock.
- Existing drainage will be studied to ensure all runoffs are detained and channelled 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 waste sites and out plan for physical/chemical treatment.
- Perimeter drain, earth drain, final drain and a proper 'Sediment Pond' will be functioning till the closure of th operation.

PROJECT PROPONENT

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73100 Johol, Negeri Sembilan Darul Khusus
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RINGKASAN EKSEKUTIF

Tapak projek yang dicadangkan, yang dikelilingi oleh ladang getah dan kelapa sawit, bertujuan untuk memproses bijih emas bagi kegunaan industri hiliran. Akses ke tapak adalah melalui Lebuhraya Utara–Selatan melalui Simpang Ampat, seterusnya melalui Simpang Ampang dan Jalan Nyalas menuju ke Pekan Gemencheh. Tapak ini dizonkan sebagai “industri” di bawah Geran Tanah, manakala di bawah Rancangan Struktur Negeri Sembilan 2045 dan Rancangan Tempatan Daerah Tampin 2035 ia dikategorikan sebagai “pertanian”.



PEMAJU PROJEK

Air Kuning Resources Sdn. Bhd.

Kediaman Rasmi, Balai Undang Luak Johol
73100 Johol, Negeri Sembilan Darul Khusus
Tel: 019-681 5533

PERUNDING EIA

MSK & Associates Sdn. Bhd.

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E-mail : msksalim@gmail.com

PENERANGAN PROJEK



Jenis mineral: Bijih emas



Jangka Hayat: 5 tahun



Aktiviti Projek:

Peringkat Operasi

- Operasi pengangkutan
- Operasi pemprosesan
- Simpanan stok
- Jualan
- Penyelenggaraan kolam pemendapan
- Mengurus sisa di tapak projek

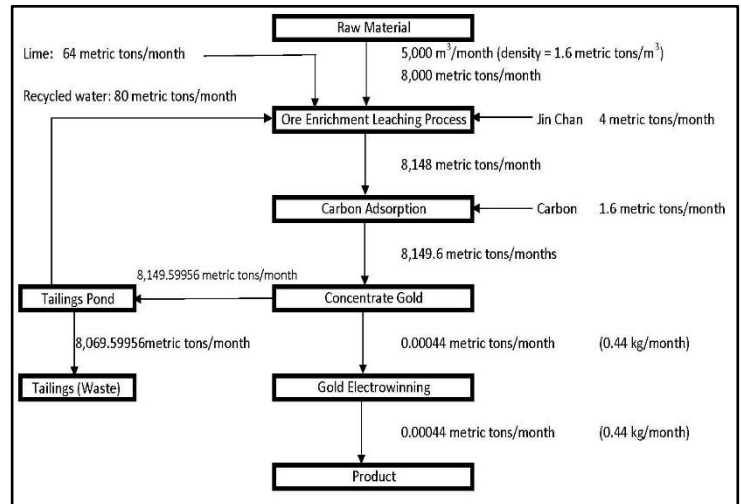
Peringkat Penutupan

- Pemulihan progresif
- Pemulihan dan penibusgunaan akhir



Lokasi:

2°32'55.15"U dan 102°29'3.79"T



Carta Alir Proses

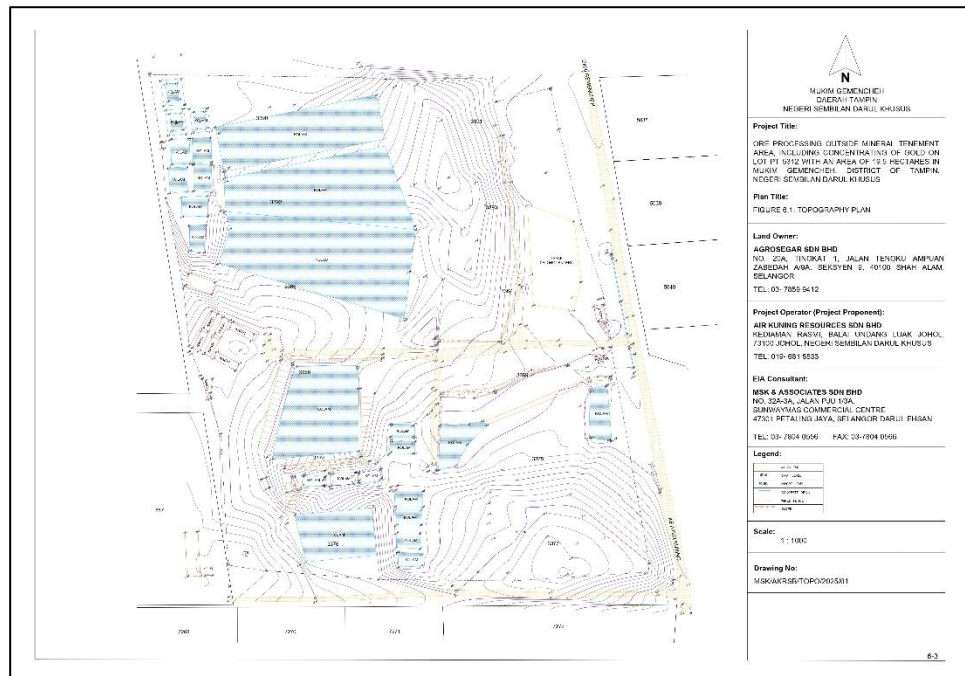
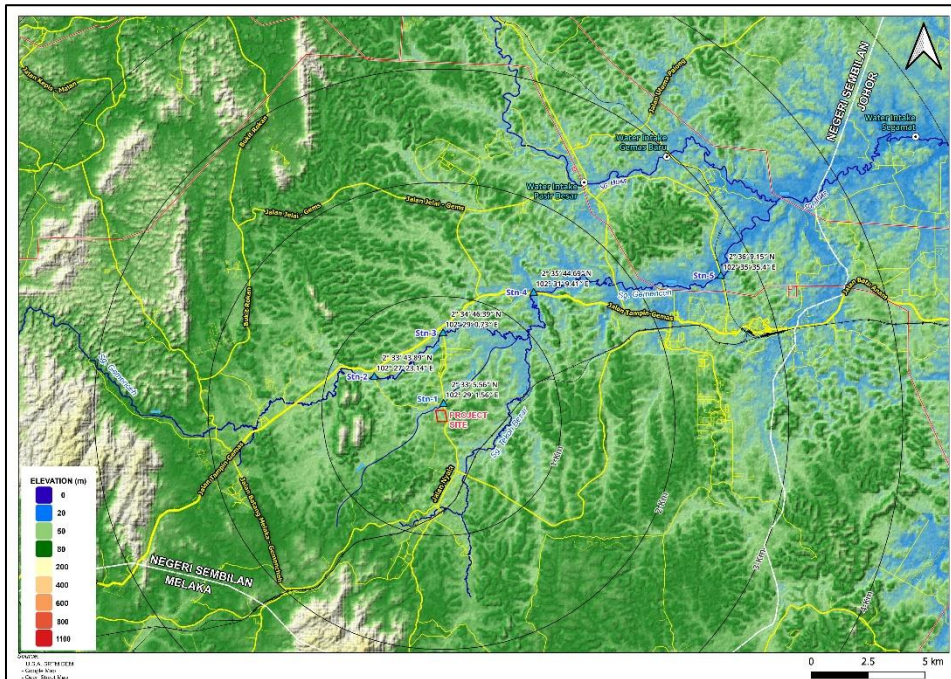
KEPERLUAN PROJEK



Projek pemprosesan bijih emas yang dicadangkan ini didorong oleh permintaan berterusan terhadap emas serta sumbangannya kepada pertumbuhan ekonomi negara.

PERSEKITARAN FIZIKAL

Topografi

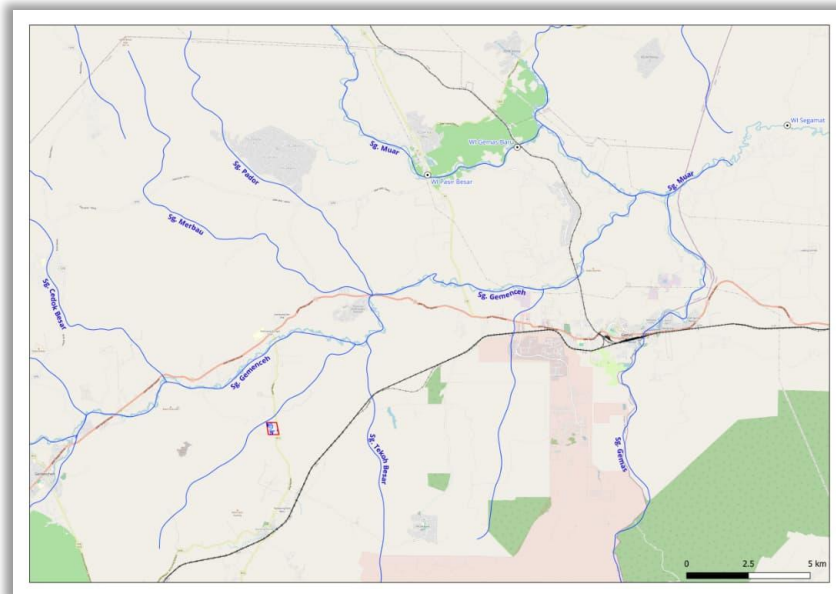


- Keunjuran beralun dengan ketinggian serendah 20 m sehingga setinggi 40 m dari aras laut purata (MSL).
- Tapak cadangan dicirikan oleh kawasan tanah rendah yang beralun secara lembut.

Geologi

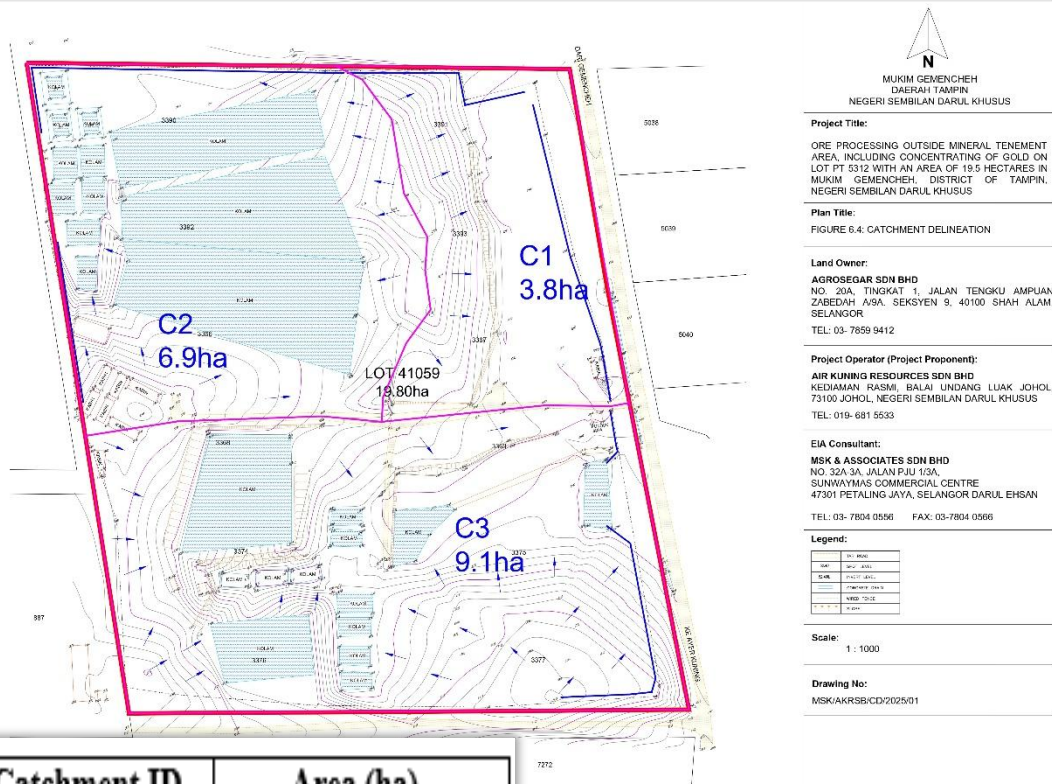
- Kawasan tapak projek dicirikan oleh latar geologi yang didominasi oleh intrusi granit dan batuan sedimen Paleozoik, dengan bukti jelas metamorfisme sentuhan (Jabatan Mineral dan Geosains Malaysia, 2004). Asosiasi tanah yang dominan di dalam kawasan ini terdiri daripada tanah Gajah Mati–Munchong–Melaka, yang terbentuk hasil luluhawa berpanjangan daripada bahan induk granit dan sedimen.

Hidrologi



- Air larian permukaan dari tapak projek akan mengalir ke arah utara menuju ke Sungai Gemenchih, seterusnya ke Sungai Muar dan akhirnya ke Selat Melaka.

Kawasan Tadahan



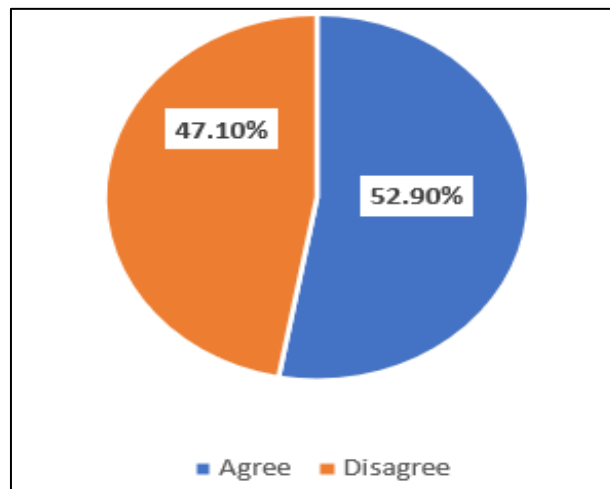
Catchment ID	Area (ha)
C1	3.7
C2	6.8
C3	9.0

- Terdapat tiga (3) kawasan tadahan (C1, C2 dan C3).
- Semua aliran larian permukaan akan disalurkan secara semula jadi ke dalam kolam mendapan berhampiran dan seterusnya mengalir ke Sungai Gemencheh melalui saluran pelepasan yang direka bentuk.

Taburan Responden

No.	Category	Residential	Count
1	Kampung	Kg Parit Buloh	50
2		Kg Sungai Dua	45
3		Kg Tenai (Hilir, Tengah) / Kg. Tenai Ayer Gelugor	36
4		Kg Ayer Gelugor	32
5		Kg Gedok	29
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13	Institusi / Penanda	SMK Ayer Kuning	1
14		SMK Bukit Jalor	1
15		SJK(C) Ayer Kuning Selatan	1
JUMLAH			308

Penerimaan Orang Ramai



Persepsi Faedah Projek

- Peluang pekerjaan
- Bermanfaat untuk ekonomi tempatan dan pembangunan negeri
- Tapak projek terletak jauh dari kawasan perumahan

KUALITI ASAS PERSEKITARAN

Kualiti Air



5 Lokasi Pemantauan

- Had parameter dibandingkan dengan Kelas II di bawah “National Water Quality Standards for Malaysia
- Plumbum, BOD, COD dan Oksigen Terlarut melebihi had Kelas III bagi sebahagian besar sampel.
- Indeks Kualiti Air (WQI) berada dalam julat 65 hingga 81, dan status sungai adalah “sedikit tercemar”.

Kualiti Bunyi



3 Lokasi pemantauan

- Waktu siang : 65 dBA
- Waktu malam : 60 dBA
- Semua sampel (N1, N2, dan N3) mematuhi had bunyi iaitu 65 dBA pada waktu siang dan 60 dBA pada waktu malam.

Kualiti Udara



3 Lokasi Pemantauan

- Keputusan dibandingkan dengan Standard Kualiti Udara Ambien Malaysia.
- Semua mematuhi had yang dibenarkan.

Parameters	Keputusan	Had
PM10, $\mu\text{g}/\text{m}^3$	43 - 55	100 $\mu\text{g}/\text{m}^3$
PM2.5, $\mu\text{g}/\text{m}^3$	17 - 21	35 $\mu\text{g}/\text{m}^3$
SO ₂ , $\mu\text{g}/\text{m}^3$	< 5	80 $\mu\text{g}/\text{m}^3$
NO ₂ , $\mu\text{g}/\text{m}^3$	< 0.5	280 $\mu\text{g}/\text{m}^3$
CO, mg/m^3	<0.5	10 $\mu\text{g}/\text{m}^3$
O ₃ , $\mu\text{g}/\text{m}^3$	< 1.0	100 $\mu\text{g}/\text{m}^3$

Haiwan



- 13 keluarga burung, 3 Mammal spp.

Tumbuh-tumbuhan



- Kawasan tapak projek dikelilingi oleh ladang getah dan kelapa sawit.
- Spesies paku-pakis seperti *Nephrolepis sp.*, *Stenochlaena sp.*, *Asystasia sp.* dan *Euphorbia hirta* didapati mendominasi kawasan tersebut. Pisang hutan (*Musa gracilis*) dan halia hutan (*Zingiber sp.*) amat lazim ditemui di bahagian tapak yang lebih dalam.
- Di sepanjang tepi ladang, tumbuhan sekunder lebih mendominasi. Ia termasuk spesies pokok dan renek seperti *Clerodendron sp.*, *Eurya acuminate*, *Ficus sp.*, *Macaranga sp.* dan *Melastoma sp.*.

IMPAK BERPOTENSI: KUALITI UDARA

AKTIVITI: Pembersihan Tapak, Simpanan *Overburden*, Pembinaan Jalan Masuk, Pergerakan Kenderaan, Pembuangan Kemudahan Tapak, Meratakan, dan Menambah Lapisan Tanah Subur

IMPAK

- Penjanaan dan penyebaran habuk.
- Reseptor sensitif lebih terdedah kepada kesan negatif kesihatan.

LANGKAH MITIGASI

- Pemeliharaan pokok dan tumbuhan sedia ada.
- Biojisim akan disimpan di tempat strategik dan distabilkan.
- Pembakaran terbuka adalah tidak dibenarkan.
- Menutupi cerun terdedah.
- Mengehadkan kelajuan kenderaan.
- *Water browser* perlu disediakan.
- Penyediaan *wash trough*.
- Pemeriksaan secara visual hendaklah dijalankan.

IMPAK BERPOTENSI: PENCEMARAN BUNYI

AKTIVITI: Pergerakan Kenderaan, Loji Pemprosesan, Pengalihan Kemudahan Tapak dan Bunyi Lalu Lintas

PENERIMA SENSITIF: Kampung Sungai Dua, Kampung Parit Buloh, MRSM Gemencheh

IMPAK

- Impak pendengaran & boleh menyebabkan gangguan mental.
- Mengganggu ketenteraman kawasan setempat dan penduduk berhampiran.

LANGKAH MITIGASI

- Kekalkan tumbuh-tumbuhan sebagai penghalang bunyi.
- Pemeriksaan dan penyelenggaraan berkala ke atas mesin dan kenderaan.
- Pemantauan berterusan tahap hingar.
- Mematuhi OSHA (pendedahan 90 dBA lebih 8 jam).
- Tetapkan had laju trak kepada 15 km/j.
- *PPE* perlu disediakan untuk pekerja.

IMPAK BERPOTENSI : KUALITI AIR

AKTIVITI: Pembersihan Tapak, Simpanan *Overburden*, Hakisan Tanah, Pembentukan AMD, Kestabilan Tanah, Loji Mencuci, Pembuangan Sisa Buangan Terjadual dan Penjajaran Tapak.

IMPAK

- Kejernihan air akan berkurangan
- Potensi pembentukan AMD

- Menjejaskan Kesihatan manusia dan penampilan estetik

- Limpahan tercemar berkemungkinan memasuki sistem saliran di kawasan sekeliling.

LANGKAH MITIGASI

- Hentikan operasi semasa tempoh hujan yang tinggi
- Mengendalikan sisa buangan terjadual dengan betul
- Kurangkan kawasan terdedah
- Pemantauan kualiti air

- Kurangkan kawasan terdedah

- Menubuhkan Amalan Pengurusan Terbaik (BMP) yang bersesuaian seperti parit tanah dan kolam mendapan.
- Penyelenggaraan BMP secara berkala.
- Meminimumkan kawasan yang terdedah.
- Menstabilkan struktur tanah yang longgar.
- Zon penampan hendaklah disediakan di sekeliling tapak projek.

IMPAK BERPOTENSI : HAKISAN TANAH DAN PEMENDAPAN

AKTIVITI: Parit Sisi Bumi & Lembangan Sedimen, Pelupusan Kering, Penyimpanan Sisa *Tailings* dan Kawasan Bumi Terdedah.

IMPAK

- Kemerosotan kualiti air dan nilai estetik

- Hakisan tanah & pemendapan

LANGKAH MITIGASI

- Penyelenggaraan berkala pada BMP dan kolam *tailings*.
- Perlindungan alur keluar lembangan sedimen dicadangkan.
- Pemasangan empangan penahan (*check dam*)

- Gunakan biojisim yang dipotong (dahan, daun dan akar) sebagai pelindung.
- Gunakan jalan yang sedia ada. Membina semula hanya setakat yang diperlukan untuk menyediakan saluran yang mencukupi.

IMPAK BERPOTENSI : PENGURUSAN SISA PEPEJAL DAN BERBAHAYA

AKTIVITI: Pengurusan Sisa Pepejal dan Berbahaya yang haram

IMPAK

- Degradasi dan pencemaran air

- Pencemaran tanah

- Tumpahan minyak diesel

LANGKAH MITIGASI

- Pemaju projek hendaklah menanggung sepenuhnya tanggungjawab sekiranya berlaku kebocoran sisa buangan terjadual ke anak sungai yang berhampiran.
- Penyimpanan bahan diesel di kawasan pelupusan diletakkan pada jarak 30 meter dari sebarang badan air dan terletak di kawasan yang relatifnya rata.

- Sisa pepejal hendaklah disimpan di dalam tong yang telah ditetapkan.
- Kitar semula dan guna semula bahan terpakai adalah digalakkan.
- Sisa buangan terjadual mesti dilabel dan disimpan mengikut **Peraturan-Peraturan Kualiti Alam Sekeliling (Sisa Terjadual) 2005**.
- Segala bekas, sama ada penuh atau kosong, hendaklah dikendalikan dengan cermat.

- Kawasan penyimpanan hendaklah dilengkapi dengan benteng (*bund*) yang mampu menampung 110% daripada isipadu tong yang terbesar.
- Papan tanda amaran hendaklah dipasang.
- Pengangkutan dan penyimpanan bahan diesel serta pelincir hendaklah menggunakan bekas yang dibina dengan reka bentuk yang diluluskan.
- Aktiviti mengisi semula diesel tidak boleh dijalankan berhampiran alur air atau saluran di tapak.

IMPAK BERPOTENSI : LALU LINTAS & PENGANGKUTAN

AKTIVITI: Pengangkutan Bijih, Pengangkutan ke Loji Pemprosesan

IMPAK

- Kesesakan lalu lintas
- Haiwan liar dilanggar oleh kenderaan

- Penyebaran kotoran di jalan awam

LANGKAH MITIGASI

- Elakkan pengangkutan pada waktu puncak
- Pasang papan had laju dan papan tanda amaran yang jelas
- Menyediakan jalan masuk yang berturap
- Kenderaan pengangkutan tidak boleh melebihi muatan

- *Wash trough* perlu disediakan
- Penyemburan jalan raya terutamanya semasa musim kering

IMPAK BERPOTENSI : PEKERJAAN, KESELAMATAN & KESIHATAN

AKTIVITI: Penggalan Sumber, Pengendalian Jentera, Loji Pemprosesan dan Lori

IMPAK

- Risiko terhadap kesihatan

- Kemalangan semasa peringkat operasi

- Penyebaran debu dan habuk mineral

LANGKAH MITIGASI

- Pastikan tiada longkang tersumbat atau kolam bertakung.
- Tiada kumbahan mentah yang mengalir ke saluran air berhampiran.
- Meningkatkan kesedaran tentang bahaya penyakit berjangkit dan bawaan vektor.
- Insurans kesihatan am untuk semua tenaga kerja.
- Menjalankan Penaksiran Risiko Kesihatan Kimia (CHRA)

- Penggunaan peralatan, alatan dan jentera terkini dalam operasi pemprosesan mineral.

- Memastikan kebersihan tapak kem dan pekerja.
- Memakai PPE.
- Pemeriksaan perubatan berkala terhadap pekerja di tapak mengenai pengumpulan toksik.

IMPAK BERPOTENSI : TERESTRIAL FLORA & FAUNA

AKTIVITI : Pembersihan tanah

IMPAK

- Kehilangan habitat flora

- Konflik hidupan liar
- Potensi kehilangan sumber makanan

LANGKAH MITIGASI

- Tanam semula cerun yang terdedah dengan serta-merta.
- Operator akan melibatkan perunding untuk kerja-kerja pemulihan *brownfield*.

- Tiada pemburuan hidupan liar.
- Perangkap sangkar untuk spesies yang terancam dan terdedah.
- Menyediakan koridor migrasi.
- Laporkan kepada Jabatan PERHILITAN yang berhampiran jika terdapat konflik.
- Penyokong projek mesti mengetahui spesies "Total Protection"

IMPAK BERPOTENSI : SOSIO EKONOMI

AKTIVITI : Biji Pengangkutan dan Pembersihan Tumbuhan

IMPAK

- Peluang pekerjaan

- Keselamatan & kesihatan orang awam

- Gangguan habuk dan bunyi

LANGKAH MITIGASI

- Mengambil pekerja tempatan sebagai sebahagian daripada tenaga kerja
- Kontraktor dan subkontraktor tempatan akan disyorkan

- Simpan rekod untuk sebarang kemalangan pengangkutan untuk perancangan langkah pencegahan yang selanjutnya
- Operator harus peka kepada pihak berkepentingan yang berdekatan.
- Pasang had laju yang jelas dan papan tanda amaran di tepi jalan awam yang berdekatan.

- *Water browser* dan *wash trough* hendaklah disediakan.

CADANGAN PROGRAM PEMANTAUAN ALAM SEKITAR

Program Rehabilitasi

- Meleraikan semua jentera di tapak, struktur mudah alih dan tidak bergerak, menutup semua saluran masuk dan keluar *sediment basin*, keluarkan semua sumber bahan toksik dan berbahaya, ujian bahan cemar, jika ada di permukaan tanah di kawasan di mana diesel, minyak, pelincir dan bahan api hidraulik disimpan.
- Memastikan pemeliharaan tanah dan penyediaan baja organik untuk penanaman, landskap dan penanaman semula hutan pada masa hadapan.
- Jadikan rupa bumi sehijau yang mungkin dengan pokok, tumbuhan, rumput dengan saluran semula jadi yang mengalir bebas seperti keadaan sedia ada sebelumnya.
- Melibatkan penduduk yang berdekatan dalam kerja pemulihan dan berikan mereka pekerjaan sebagai pemegang kepentingan.

Kerja-kerja Rehabilitasi

- Penambakan awal yang merangkumi pengeluaran semua peralatan dan jentera berat, loji mencuci, pemasangan elektrik, lori, tangki minyak gelincir dan struktur tetap yang lain. Ini akan dilakukan oleh pakar berlesen.
- Tapak ini akan bebas daripada sebarang kesan sisa buangan terjadual, minyak, diesel dan pelincir. Bentuk tanah akan digredkan kepada piawaian yang boleh diterima berhubung dengan kriteria alam sekitar.
- Pemulihan progresif semasa operasi sedang dijalankan, seperti, kerja-kerja landskap di akses utama dan lokasi penting di dalam tapak bersama-sama dengan penanaman, penyemaian akan dijalankan tanpa menunggu pemberhentian operasi.

Peringkat Selepas Operasi

- 'Pemetaan Ekologi dan Tanah' terperinci tapak terdegradasi sedia ada.
- Tumbuhan dan pokok sedia ada di zon pinggir dan penampakan akan disenaraikan sebagai inventori sebagai sebahagian daripada perancangan pemulihan ekologi.
- Pengenalpastian dan penyediaan inventori tumbuhan, pokok sederhana dan tumbuhan menjalar yang sesuai untuk pemulihan tapak. Pengenalpastian jenis *overburden*/tanah yang sesuai untuk kawasan hijau dan penampakan. Isipadu tanah/*overburden* akan dianggarkan meliputi semua yang terdedah. Lokasi dan jaraknya perlu dikira. Pada masa ini, bagaimanapun, terdapat tanah/*overburden* yang tidak digunakan di sepanjang tapak akan diangkut untuk menutup kerak bumi yang diperbuat daripada batu granitik pepejal.
- Saliran sedia ada akan dikaji untuk memastikan semua air larian ditahan dan disalurkan dengan baik.
- Kualiti air pelepasan akhir dari segi sebarang keupayaan mencemarkan di dalamnya kepada aliran air yang bersebelahan.
- Kajian tapak yang tercemar, cth., kawasan tangki minyak gelincir, tapak buangan terjadual dan pelan keluar untuk rawatan fizikal/kimia.
- Longkang perimeter, longkang tanah, longkang akhir dan kolam sedimen yang betul akan berfungsi sehingga penutupan operasi.

PEMAJU PROJEK

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PERUNDING EIA

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