

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED QUARRY FOR DEVELOPMENT OF HOUSING SCHEME ON LOT 611, 617, 632, 1536, 1537, 1571, 1572, 1574, 1575, 1576, 1577, 4155, 4156, 4158, 3509 & A PART OF LOT 4159, MUKIM 20, GUAR PERAHU, SEBERANG PERAI TENGAH, PULAU PINANG

EXECUTIVE SUMMARY

PROJECT DEVELOPER:



Kencana Buana Sdn Bhd

ENVIRONMENTAL CONSULTANT:



Kenviro Services

Land Owner : JKP Sdn. Bhd.

Project Developer & Project Proponent: Kencana Buana Sdn. Bhd.

Lot No. & Size: Lot 611, 617, 632, 1536, 1537, 1571, 1572, 1574, 1575, 1576, 1577, 4155, 4156, 4158, 3509 & a part of Lot 4159 covering an area of 45.57 hectares.

Type of Development: Quarry

Project Background: The proposed development is intended for a phased residential housing project designed to meet future community needs in a planned and sustainable way.

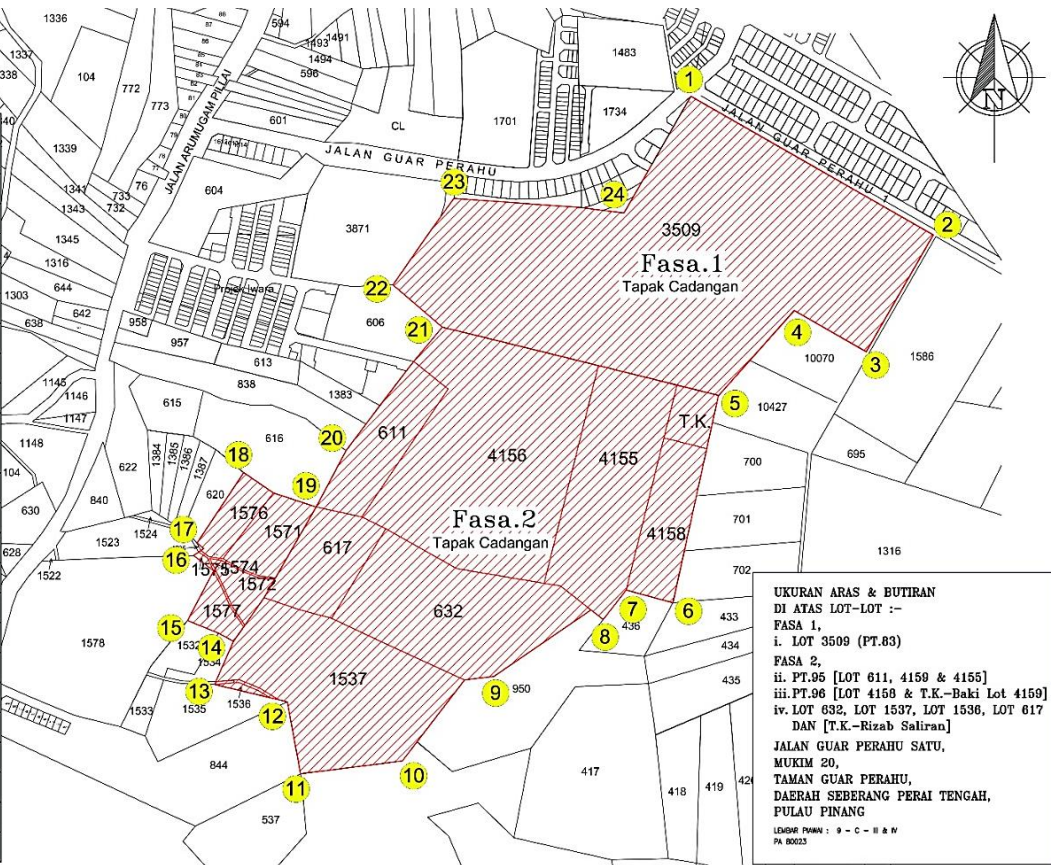
LEGAL ASPECT - PRESCRIBED ACTIVITIES



First Schedule
Activity 19 : Quarry : Quarrying of rock

LOT DEMARCATION PLAN

| COORDINATES | | |
|-------------|--------------|----------------|
| NO. | LATITUDE | LONGITUDE |
| 1 | 5°25'40.99"N | 100°28'30.01"E |
| 2 | 5°25'34.66"N | 100°28'41.14"E |
| 3 | 5°25'29.38"N | 100°28'38.05"E |
| 4 | 5°25'31.25"N | 100°28'34.78"E |
| 5 | 5°25'27.27"N | 100°28'31.25"E |
| 6 | 5°25'17.80"N | 100°28'29.18"E |
| 7 | 5°25'18.39"N | 100°28'27.03"E |
| 8 | 5°25'17.04"N | 100°28'25.98"E |
| 9 | 5°25'14.38"N | 100°28'20.92"E |
| 10 | 5°25'10.52"N | 100°28'16.79"E |
| 11 | 5°25'9.95"N | 100°28'12.14"E |
| 12 | 5°25'13.22"N | 100°28'11.53"E |
| 13 | 5°25'14.04"N | 100°28'8.21"E |
| 14 | 5°25'15.99"N | 100°28'9.04"E |
| 15 | 5°25'16.95"N | 100°28'6.99"E |
| 16 | 5°25'19.93"N | 100°28'7.28"E |
| 17 | 5°25'20.53"N | 100°28'7.43"E |
| 18 | 5°25'23.69"N | 100°28'9.49"E |
| 19 | 5°25'22.12"N | 100°28'12.84"E |
| 20 | 5°25'24.77"N | 100°28'14.21"E |
| 21 | 5°25'30.45"N | 100°28'18.67"E |
| 22 | 5°25'32.38"N | 100°28'16.41"E |
| 23 | 5°25'36.31"N | 100°28'19.17"E |
| 24 | 5°25'35.65"N | 100°28'26.97"E |

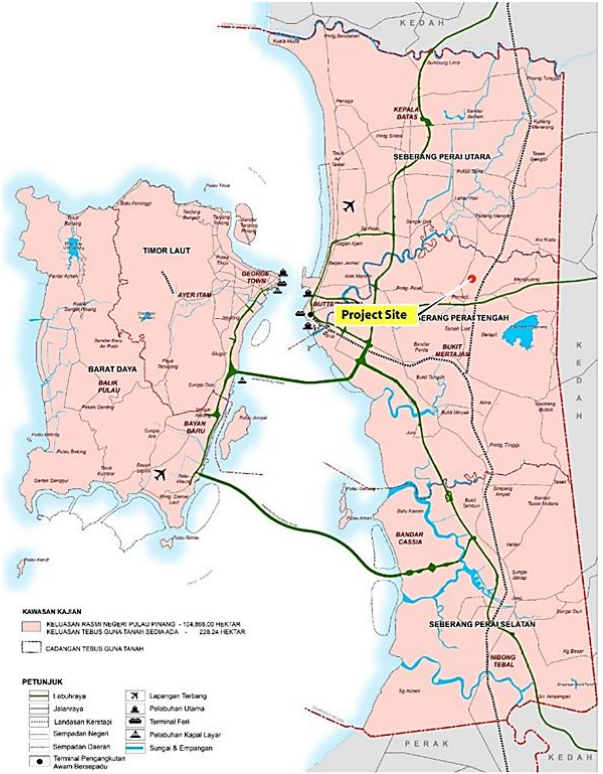


UKURAN ARAS & BUTIRAN DI ATAS LOT-LOT :-
FASA 1,
 i. LOT 3509 (PT.83)
FASA 2,
 ii. PT.95 [LOT 611, 4159 & 4155]
 iii. PT.96 [LOT 4156 & T.K.-Baki Lot 4159]
 iv. LOT 632, LOT 1537, LOT 1536, LOT 617 DAN [T.K.-Rizab Saliran]
JALAN GUAR PERAHU SATU, MUKIM 20, TAMAN GUAR PERAHU, DAERAH SEBERANG PERAI TENGAH, PULAU PINANG
 LONDRE PRAWN : 9 - C - 8 - 8 V
 PK 80023

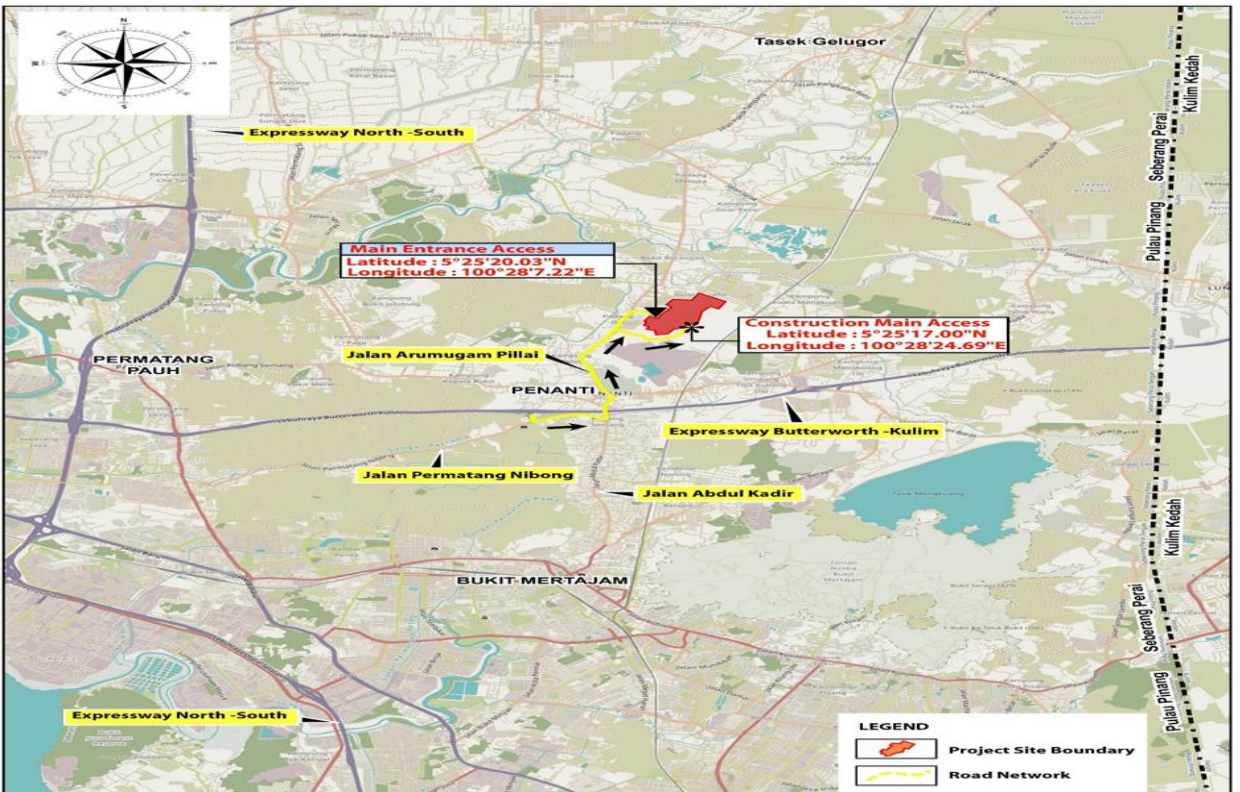
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EXECUTIVE SUMMARY

PROJECT LOCATION



ACCESSIBILITY TO THE PROPOSED PROJECT SITE



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EXECUTIVE SUMMARY

NEAREST RECEPTORS



Butterworth - Kulim Expressway



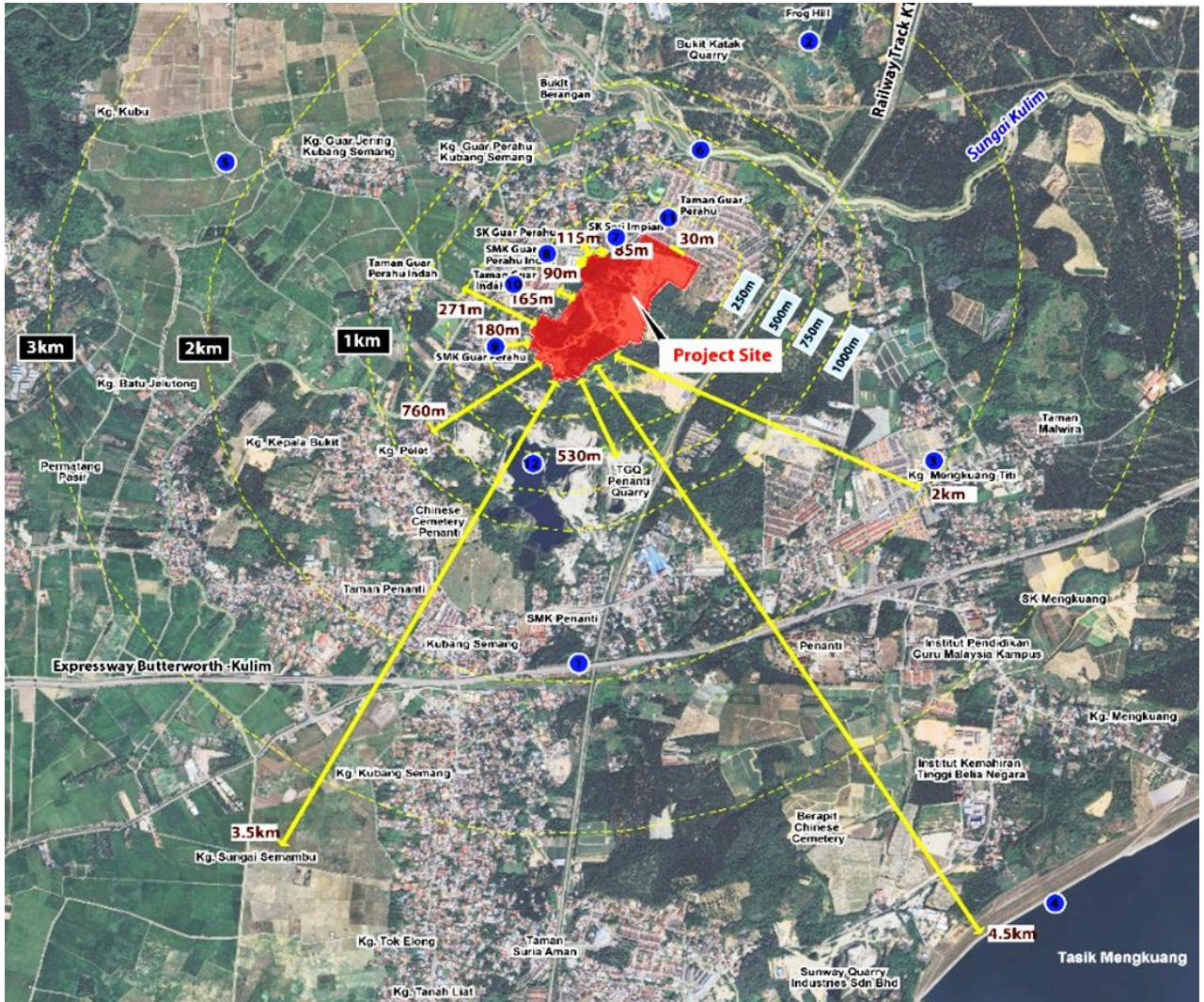
Frog Hill



Kampung Mengkuang Titi



Mengkuang Dam



Paddy Field



Ibu Bekalan Sungai Kulim



Sekolah Kebangsaan Seri Impian



SMK Guar Perahu Indah



SMK Guar Perahu



Taman Guar Perahu Indah



Taman Guar Perahu

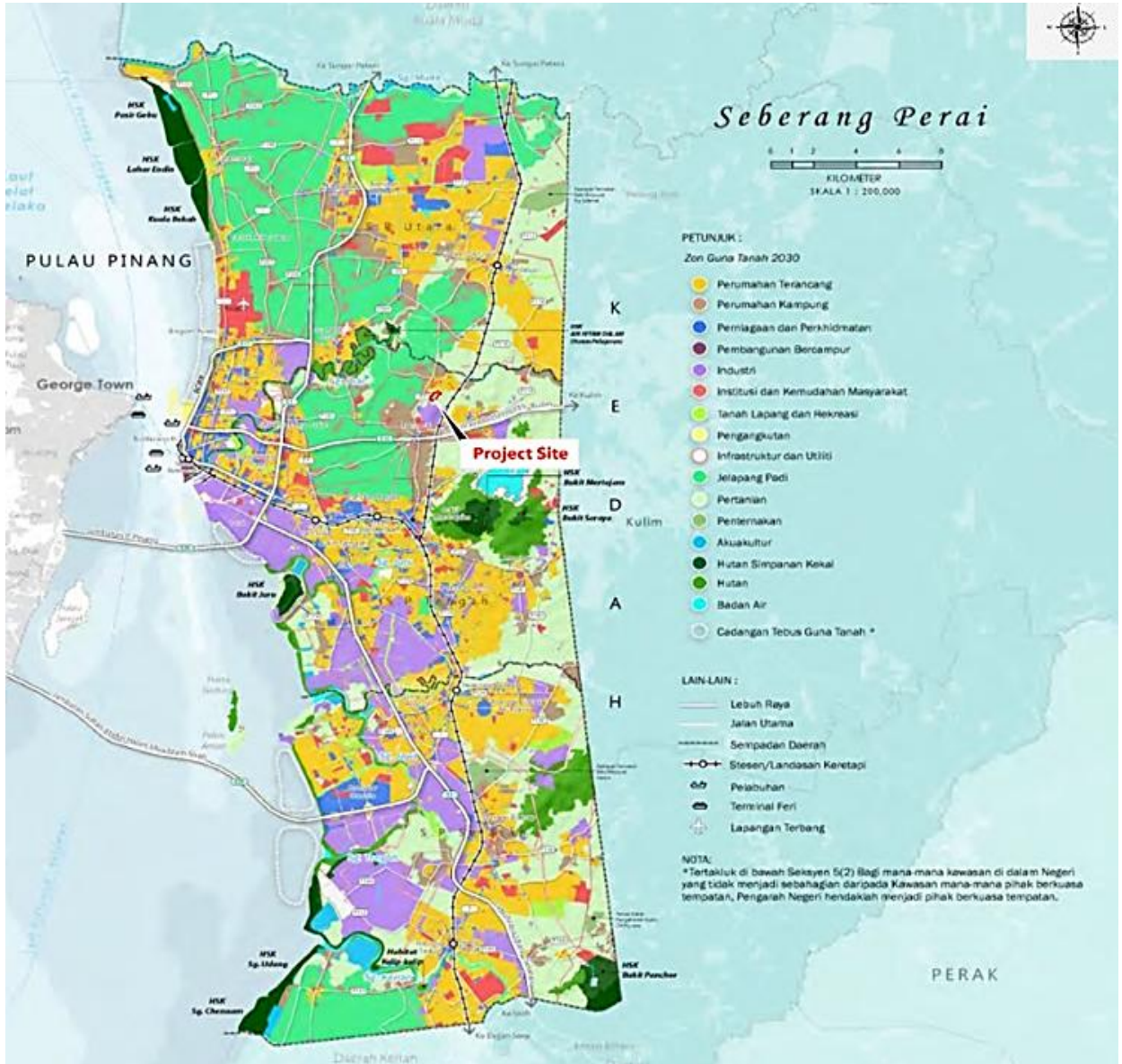


Tasik Mengkuang

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EXECUTIVE SUMMARY

LANDUSE ZONING COMPATIBILITY



The Phase 2 area, originally zoned for agriculture, was rezoned to Kawasan Keutamaan Pembangunan 1 (KKP 1) for residential development and approved on 31 January 2025, in accordance with the RTSP2030 housing policy.

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EXECUTIVE SUMMARY

STATEMENT OF NEEDS



01

Meets housing needs of Seberang Perai Tengah (SPT), where over 55,000 new housing units are required by the year 2030 to accommodate growing population demands



02

Supports affordable and low-cost housing, reflecting the State's commitment to improving access for the B40 income group, under the Program Perumahan Mampu Milik (PPMM) initiative.

Creates direct & indirect job opportunities – boosts local incomes and skills









03

Aligns with Malaysia's Mineral Policy (DMN2) for resource self-sufficiency.



04

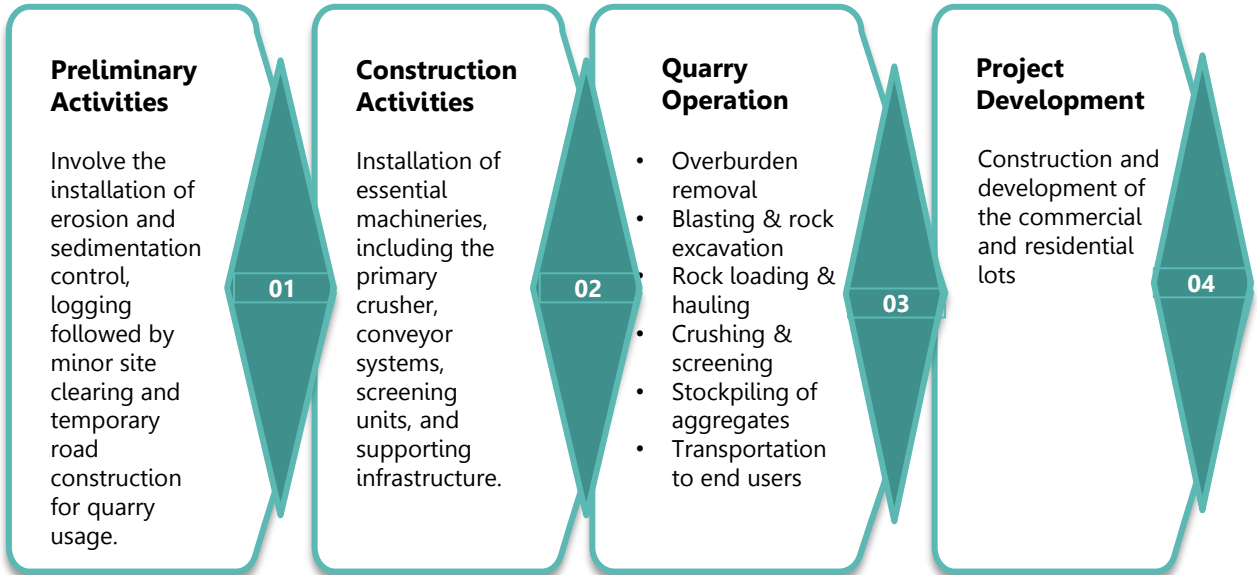
PROJECT OPTIONS

| "NO PROJECT" OPTION | PROJECT EXECUTION |
|-------------------------------------|--|
| No jobs, no revenue, no development | <ul style="list-style-type: none">  Quarry = Boosts economy, jobs, state income  Supports roads, housing, industrial growth  Reduces reliance on imports (DMN2 policy)  Affordable housing for low income group  With mitigation – impacts manageable  Final Choice: Proceed with Quarry |

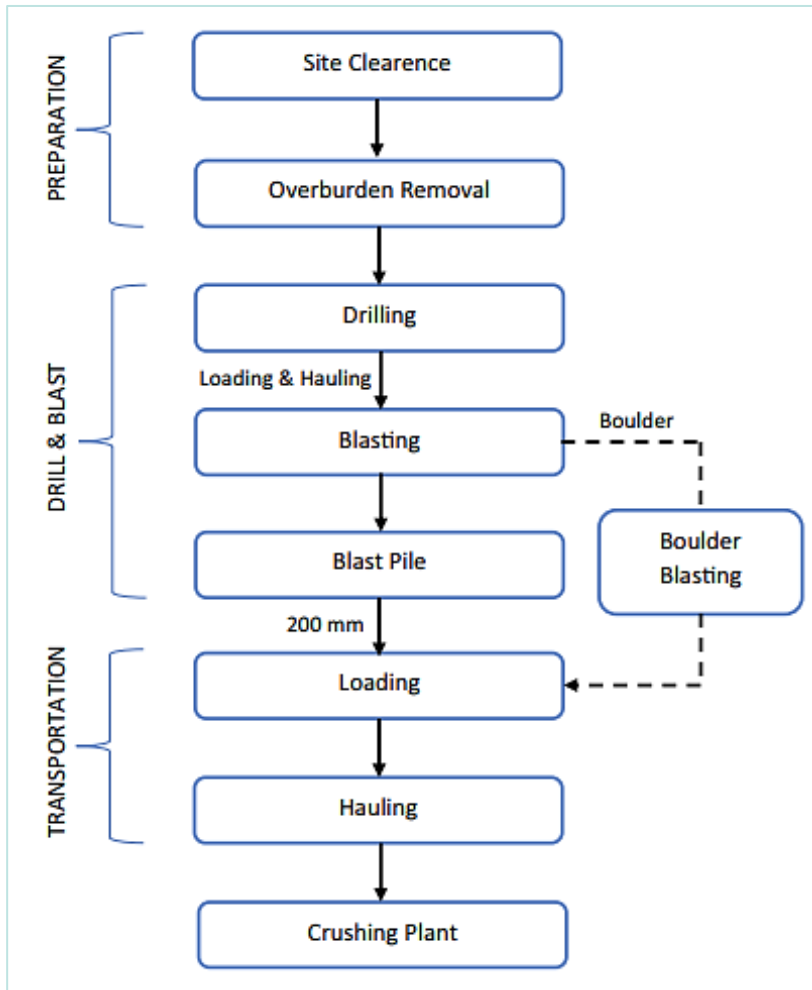
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EXECUTIVE SUMMARY

PROJECT ACTIVITIES



QUARRY OPERATION FLOWCHART



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EXECUTIVE SUMMARY

PROJECT COMPONENTS



LEGEND

- AREA UNDER MINING LEASE
- BUFFER ZONE (20m)
- ROCK EXTRACTION AREA BY BLASTING ACTIVITY
- TEMPORARY OVERBURDEN STOCKPILE AREA
- SEDIMENT BASIN
- EARTH DRAIN
- EARTH ROAD
- PROPOSED CHECK DAM
- SILT FENCE
- WASH TROUGH

| No. | Usage | Area (Ha.) | Percentage |
|--------------|-----------------------------|--------------|---------------|
| 1. | Phase 1 Project Development | 15.42 | 34.88 |
| 2. | Phase 2 Project Development | 25.33 | 57.29 |
| 3. | Buffer Zone | 3.46 | 7.83 |
| Total | | 44.22 | 100.00 |


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EXECUTIVE SUMMARY

PROJECT UTILITIES



Electricity Source = 500 kVA Genset



Water Demand = 7000 gallons per day



Facilities= Office, workshop, toilet and guardhouse



No workers quarters will be established within project site

PROJECT IMPLEMENTATION SCHEDULE

| Task / Description | 2025 | | | | | | | | | | | | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---------------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | | | | | | | | | |
| Submission and Approval | | | | | | | | | | | | | | | | | | | | | | |
| Preparation of EIA report | | | | | | | | | | | | | | | | | | | | | | |
| Submission of EIA report | | | | | | | | | | | | | | | | | | | | | | |
| Approval of EIA report | | | | | | | | | | | | | | | | | | | | | | |
| Submission and approval of EMP report | | | | | | | | | | | | | | | | | | | | | | |
| Submission and approval of ESCP plan | | | | | | | | | | | | | | | | | | | | | | |
| OMS Approval by JMG | | | | | | | | | | | | | | | | | | | | | | |
| Blasting License Approval by PDRM | | | | | | | | | | | | | | | | | | | | | | |
| Earthwork and Blasting | | | | | | | | | | | | | | | | | | | | | | |
| Site clearing | | | | | | | | | | | | | | | | | | | | | | |
| Access road preparation | | | | | | | | | | | | | | | | | | | | | | |
| BMPs installation | | | | | | | | | | | | | | | | | | | | | | |
| Sedimentation pond preparation | | | | | | | | | | | | | | | | | | | | | | |
| Biomass removal/ logging | | | | | | | | | | | | | | | | | | | | | | |
| Crushing plant area preparation | | | | | | | | | | | | | | | | | | | | | | |
| Crushing plant installation | | | | | | | | | | | | | | | | | | | | | | |
| Blasting work in Phase 1 | | | | | | | | | | | | | | | | | | | | | | |
| Blasting work in Phase 2 | | | | | | | | | | | | | | | | | | | | | | |
| Quarrying Operation | | | | | | | | | | | | | | | | | | | | | | |
| Housing Development in Phase 1 | | | | | | | | | | | | | | | | | | | | | | |
| Housing Development in Phase 2 | | | | | | | | | | | | | | | | | | | | | | |

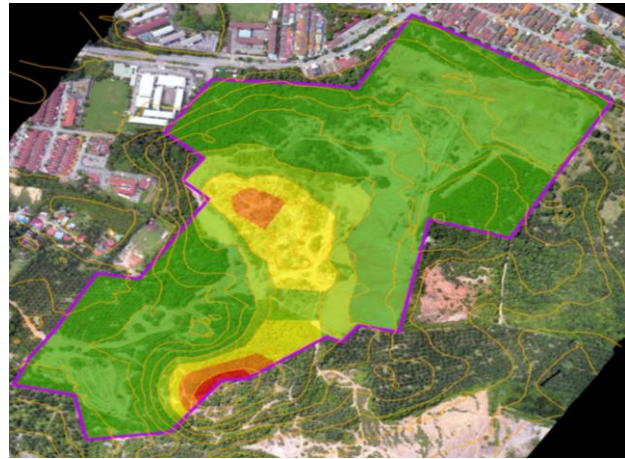
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EXECUTIVE SUMMARY

EXISTING ENVIRONMENT - PHYSICAL

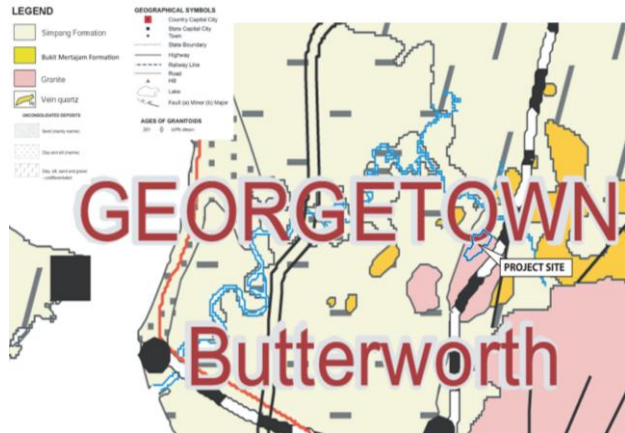
TOPOGRAPHY

- Project Site consists of hilly terrain and undulating landform.
- Area is mainly covered with dense secondary vegetation and shrubs.
- Elevation ranges from 0 m to 25 m above mean sea level (amsl).
- Highest point: 20-25 m in the southern and central regions of the project site.
- Lowest point: 0-5 m in the norther and southwestern regions of the project site.



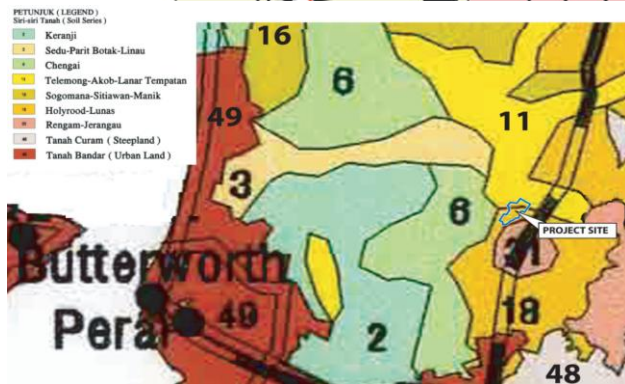
GEOLOGY

- Based on the Geological Map (9th Ed., 2014) by JMG, the Project Site lies within a regional setting characterized by the presence of marine and continental deposits.
- These deposits primarily consist of clay, silt, sand, and gravel, originating from the Granite formation on Main Range Granite.



SOIL INVESTIGATION

- The dominant soil group at the Project site based on the Soil Map of Peninsular Malaysia are soil series of the Telemong-Akob-Lanar Tempatan and Sogomana-Sitiawan-Manik
- Soil Investigation (SI) study was carried out at Lot 3509 (Phase 1) via Mackintosh Probe Tests (in-situ testing).
- Comprehensive SI study was carried out on Lots 611, 617, 632, 1537, 4155, 4156, 4158 & 4159 (Phase 2) by employing 10 boreholes.



| Aspect | Phase 1 | Phase 2 |
|------------------------------|---|---|
| Layer 1 | Soft to Firm Silty Clay / Clayey Silt (0.0–2.5 m) | Overburden Soil (0.0 – 8.8 to 24.7 m) • Stiff to hard sandy silty clay / dense silty sand |
| Layer 2 | Firm to Stiff Clay or Silty Clay (2.5–4.5 m) | Not explicitly separated, but overburden layer includes deeper stiff materials with good bearing values |
| Layer 3 | Very Stiff/Hard Residual Soil or Decomposed Rock (>4.5 m) • Probe refusal indicates possible weathered bedrock | Bedrock Formation (> ~9 m to 25 m) • Slightly weathered to fresh granite |
| Groundwater Condition | No groundwater encountered during testing • Seasonal water table expected at 1.5–2.5 depth | Not specifically reported, but inferred to be deeper due to dense soils and bedrock |

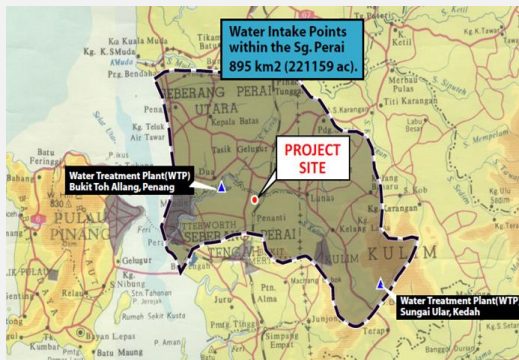
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EXECUTIVE SUMMARY

EXISTING ENVIRONMENT -PHYSICAL

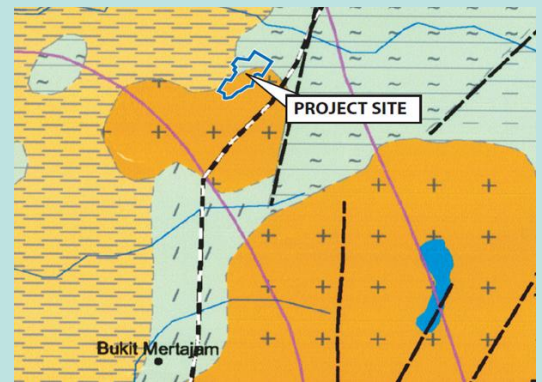
HYDROLOGY

- The proposed Project Site lies within Sungai Perai catchment and only the Bukit Tualang Water Treatment Plant is identified within the catchment, located upstream of the site.
- The surface runoff from the Project Site drains into the existing Sg Kulim tributary before flowing into Sungai Perai.



HYDROGEOLOGY

Northern portion of the Project Site is situated on a high aquifer region, whereas the southern portion of the Project Site is characterized by a low aquifer.



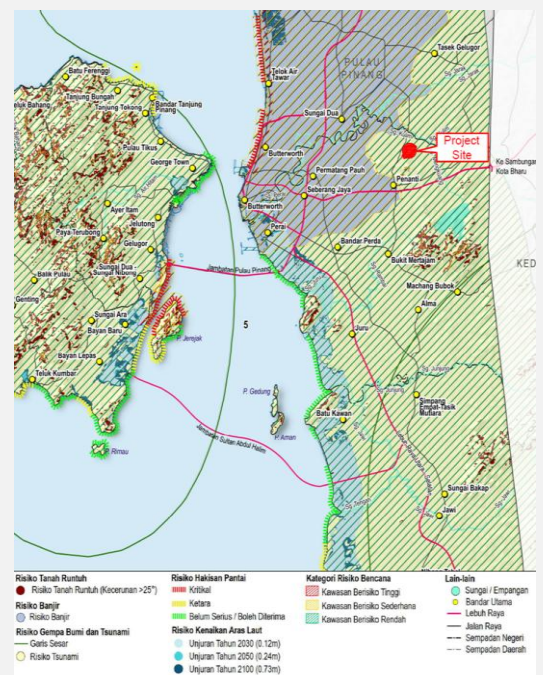
CLIMATE

Reference Station: Prai station

- General Climate**
 - Project area experiences a warm, humid equatorial climate year-round.
- Mean Maximum Temperature**
 - Highest mean max temperature: 30.6°C in March 2016.
 - Lowest mean max temperature: 26.6°C in January 2018.
- Rainfall**
 - Highest monthly rainfall: 650.6 mm in October 2019.
 - Lowest monthly rainfall: 0.0 mm in February 2014.
- Wind Profiles**
 - Frequent calm conditions (<0.3 m/s for 6.3% of the year).
 - Highest wind occurrence:
 - 25.8% from East at 1.7 m/s
 - 18.3% from Northeast at 1.9 m/s
 - Lowest wind occurrence: 5.4% from Southeast at 1.7 m/s

FLOOD RISK

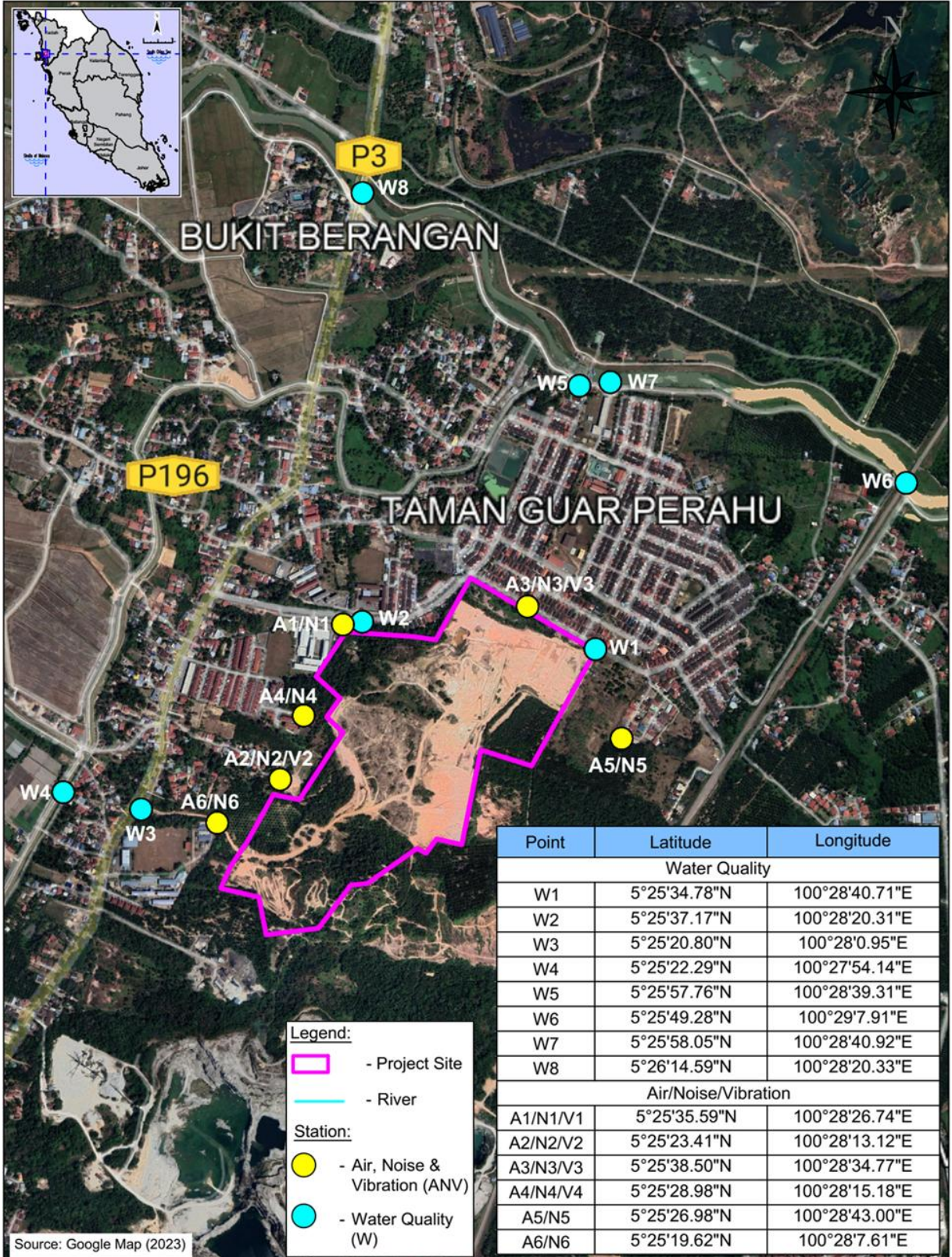
The site is situated in an area with a low risk of flooding.



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EXECUTIVE SUMMARY

EXISTING ENVIRONMENT – BASELINE MONITORING



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EXECUTIVE SUMMARY

BASELINE MONITORING

WATER QUALITY

| Sampling Point | WQI | DOE CLASSIFICATION |
|-----------------------|-------------------------|---------------------------|
| W1 | Class II 81 | Clean |
| W2 | Class II 81 | Clean |
| W3 | Class II 74 | Clean |
| W4 | Class II 77 | Clean |
| W5 | Class II 67 | Clean |
| W6 | Class III 66 | Clean |
| W7 | Class III 58 | Clean |
| W8 | Class III 64 | Clean |

AIR QUALITY



All parameters at all sampling stations comply to Malaysian Ambient Air Quality Standards, Standard 2020.

NOISE LEVEL



Noise level measurements across all monitoring locations indicated that average LAeq readings during both daytime and night time remained within the Recommended Permissible Sound Level. Specifically, sites N1 and N2, located in commercial business zones, recorded levels below 70 dBA (day) and 65 dBA (night), while N3, situated in a mixed residential area, recorded levels below 65 dBA (day) and 60 dBA (night), meeting all regulatory limits.

VIBRATION LEVEL



Vibration level monitoring at locations V1, V2, V3, and V4 showed that the maximum Peak Particle Velocity (PPV) readings along the z-axis complied with the respective limits. These limits are defined under the Third Schedule of the Guidelines for Environmental Vibration Limits and Control (3rd Edition, 2021), which outline recommended thresholds for human response and annoyance in commercial, business, and residential areas.

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EXECUTIVE SUMMARY

EXISTING ENVIRONMENT - SOCIAL

Study Area & Methodology

- Data gathered from secondary sources and social surveys (questionnaires).
- Target group: Heads of households within 1 km corridor of project range.
- Total of 400 respondents sampled using random sampling (95% confidence level, 5% error).

| Significant Impact Zone 0 – 3 KM (Zone 1) | | Indirect Impact Zone 3 – 5 KM (Zone 2) | |
|---|------------|--|------------|
| Residents Area | Sample | Residents Area | Sample |
| Taman Guar Perahu | 25 | Kampung Padang Temusu | 1 |
| Taman Guar Perahu Indah | 14 | Kampung Padang Buluh | 16 |
| Taman Guar Indah | 16 | Kampung Guar Jering | 20 |
| Kampung Padang Ibu | 17 | Kg.Tok Jawa | 18 |
| Kampung Guar Perahu | 16 | Kg.Kepala Bukit | 14 |
| Kampung Mengkuang Mak Sulong | 24 | Taman Ara Indah | 14 |
| Kampung Guar Ipoh | 15 | Kampung Permatang Pasir | 10 |
| Kampung Pelet | 15 | Kg.Bukit Indera Muda | 20 |
| Kampung Penanti Gate | 15 | Kg.Bahru | 14 |
| Taman Penanti Indah | 14 | Kg.Bukit Jelutong | 15 |
| Taman Penanti | 10 | Taman Guar Perahu | 10 |
| Kampung Petani | 16 | | |
| Kampung Kubang Ulu | 3 | | |
| Taman seri Mengkuang | 14 | | |
| Taman Mengkuang Indah | 14 | | |
| Kg.Kuala Mengkuang | 20 | | |
| Kampung Mengkuang Titi | 7 | | |
| Kampung Guar Petai | 7 | | |
| Kampung Bukit Berangan | 14 | | |
| Amount | 248 | | 152 |

Social Survey Results – Community Perception and Impacts

- ✓ 70.5% support the project outright.
- ✓ 17.5% support it with conditions (mainly environmental concerns, phased implementation, affordability).
- ✓ 12% do not support the project (due to traffic, pollution, safety concerns).
- ✓ Zone 1 (0–3 km): 60.48% support; 20.16% conditional support; 19.35% do not support
- ✓ Zone 2 (3–5 km): 86.84% support; 13.16% conditional support; 0% opposition

 **Top Reasons for Supporting the Project**

- ✓ Improve local socio-economic status
- ✓ Develop surrounding area
- ✓ Increase population and property value
- ✓ Enhance transport infrastructure

 **Perceived Socioeconomic Impact**

- ✓ 100% say no job loss or property loss.
- ✓ 5% may need to relocate.
- ✓ 32.5% feel the project could lead to marginalization.

 **Environmental Perceptions**

- ✓ River water quality: Good (52.75%), Moderate (46%)
- ✓ Air quality, noise, public safety, aesthetics: 95–98% say very good
- ✓ Traffic conditions: Mixed – 12.5% very bad, 26% moderate
- ✓ Topography awareness: 82% rated very good

 **Top Concerns Among Opponents**

- ✓ Dusty/damaged roads and speeding lorries
- ✓ Noise increase
- ✓ Social issues from foreign workers
- ✓ Pollution and traffic congestion

 **Perceived Health & Safety Effects**

- ✓ Increased accidents: Only 3.5% believe so
- ✓ Noise impact: 22.5% believe it's added
- ✓ Traffic congestion: 31.25% concern
- ✓ Air pollution: 22.75% concern
- ✓ Water pollution: 31.5% concern
- ✓ Safety risks to residents: 35.25% concern

 **Job Opportunities**

- ✓ 51.8% believe the project will create jobs while 48.2% said no
- ✓ 28% are interested in project-related jobs

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Pre-Construction and Construction Phase

IMPACT

- The pre-construction conditions indicate a low risk of erosion, with average erosion rates of 48.09 tonnes/ha/yr for Catchments 1A and 1B, and 99.30 tonnes/ha/yr for Catchment 2. This is primarily attributed to the current slope characteristics.
- However, under a worst-case scenario where earthworks are conducted without any mitigation measures, the erosion rates are projected to increase substantially to 2,289.89 tonnes/ha/yr for Catchments 1A and 1B, and 2,546.22 tonnes/ha/yr Catchment 2.

MITIGATION MEASURES

- With the implementation of appropriate erosion and sediment control measures, the overall erosion rates are significantly reduced to 10.08 tonnes/ha/yr for Catchments 1A and 1B, and 11.20 tonnes/ha/yr for Catchment 2.
- The mitigation measures include:
 - Installation of perimeter drains and earth bunds, U-shaped culverts, check dams, and lined drains.
 - Staged land clearing, proper vegetation waste disposal.
 - Install/maintain check dams, sedimentation ponds, culverts.
 - Regular water quality monitoring of discharge.
 - Paved roads and upgraded drainage systems.
 - Cover crops on exposed areas; maintain 10m buffer zones.
 - Maintain vegetation within drainage reserves.



SOIL EROSION & SEDIMENTATION

Operational Phase

IMPACT

- Quarry operations typically involve extensive earthworks such as overburden removal, benching, and haul road construction. These activities significantly disturb the natural ground cover, exposing bare soil surfaces to direct rainfall impact. As a result, there is an increased risk of erosion, particularly during the rainy season. The mobilized sediments may be transported via surface runoff into nearby watercourses, leading to siltation, increased turbidity, and degradation of aquatic habitats downstream.

MITIGATION MEASURES

- Carry out phased activities and limit exposed surfaces as recommended under LDP2M2, to control erosion rates and minimize disturbance during quarry operations.
- Implement slope protection measures including turfing, hydroseeding, and geotextile application as outlined in LDP2M2, to stabilize exposed slopes and reduce surface runoff.
- Topsoil stripped separately and stored with cover.
- Weekly inspection of drains, slopes, and stockpiles.
- Immediate corrective action for damages.
- Stockpiles to be reused, leveled, topsoiled, and re-vegetated.

EXECUTIVE SUMMARY

SUMMARY OF IMPACT



RIVER WATER QUALITY

Pre-Construction and Construction Phase

IMPACT

- Site Clearing & Earthworks activities (cut) will expose soil surfaces, increasing erosion and sediment runoff risk.
- Rain events may cause sediment-laden runoff due to insufficient ground cover.
- Deterioration of water quality in nearby streams due to:
 - Sediment transport during rainfall
 - Inadequate wastewater treatment (sewage, sullage)
 - Accidental discharge of hazardous substances (e.g., O&G)
- QUAL2K was used to model TSS and assess potential impacts, revealing the following findings:
 - ❖ Sg. Kubang Semang (downstream):
 - No change in NWQS class for simulated TSS compared to baseline
 - Except in Scenarios 1 and 2, where TSS falls within Class II (improvement from baseline Class III)
 - ❖ Sg. Kulim (downstream):
 - No change in NWQS class for simulated TSS across all scenarios; remains at Class III

MITIGATION MEASURES

- Implement phased clearing and limit open areas at any one time as prescribed under LDP2M2, to reduce exposed soil and minimize erosion.
- Install BMPs such as sediment control structures for example silt fences, sediment basins, and check dams according to LDP2M2 guidelines to trap and manage runoff effectively.
- Stabilize cleared slopes immediately using turfing, hydroseeding, or erosion control blankets as recommended in LDP2M2, to prevent soil wash-off into nearby waterways.

Operational Phase

IMPACT

- Elevated soil erosion and TSS levels due to blasting, and earthworks, leading to sediment-laden runoff entering nearby water bodies.
- Increased sedimentation in tributary Sg Kulim, a shallow and narrow stream, resulting in riverbed clogging, reduced flow, and potential flooding.

MITIGATION MEASURES

- Phased quarrying to enable progressive rehabilitation and maintain natural water balance.
- Maintain and regularly desilt sediment control structures (e.g., silt traps, detention ponds) to ensure effective capture of suspended solids in compliance with LDP2M2.
- Construct proper drainage systems with energy dissipators to control runoff velocity and prevent direct discharge of turbid water into natural waterways.
- Implement water quality monitoring programmes at key discharge points to detect exceedances early and ensure compliance with NWQS (National Water Quality Standards).
- Establish buffer zones around water bodies to protect aquatic habitats and filter runoff.

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Pre-Construction and Construction Phase

IMPACT

- Increased particulate matter (PM10 and TSP) due to vegetation clearing, soil disturbance, and machinery movement, contributing to ambient dust levels.
- Elevated exhaust emissions (NO_x, CO, SO₂) from heavy machinery and logging equipment, degrading local air quality.
- Temporary reduction in natural air filtration as tree removal decreases canopy cover, reducing the area's ability to absorb air pollutants

MITIGATION MEASURES

- Regular water spraying on exposed surfaces, unpaved roads, and cleared areas to suppress dust and reduce particulate emissions.
- Use of well-maintained machinery with low-emission engines and compliance to emission standards to minimize exhaust pollutants.
- Preserve buffer vegetation zones and avoid excessive clearing to maintain some level of natural air filtration and dust containment.



AIR POLLUTION

Operational Phase

IMPACT

- High generation of fugitive dust (PM10 and TSP) from blasting, crushing, and movement of heavy machinery and vehicles on unpaved roads.
- Exhaust emissions (NO_x, CO, SO₂, PM2.5) from diesel-powered equipment and transport trucks contribute to local air pollution and greenhouse gas load.
- Dust dispersion along transportation routes may affect nearby residential areas and roadside vegetation, reducing air quality and visibility.

✓ **Modelling**

- Conducted using **AERMOD** for **PM10** pollutant.
- Focused on **nearest sensitive receptors**: schools, residential areas, surau.
- Compared two scenarios: **Without** and **With** control measures.

❖ **Without Control Measures**

- **High incremental PM10 levels** observed at receptors, reaching up to **1,178.3 µg/m³ (24-hr avg)** at Nearest Kg (A2).
- **Cumulative concentrations** exceeded acceptable air quality standards.

✓ **With Control Measures**

- **PM10 levels significantly reduced.**
- Max **cumulative 24-hr avg** are within permissible limits.

MITIGATION MEASURES

- Apply water spraying or chemical dust suppressants regularly on haul roads and exposed surfaces to minimize fugitive dust emissions
- Use covered conveyor, hopper and crushers with sprinkler installed
- Enclosed screen and transfer points with water sprinkler installed
- Ensure regular maintenance of quarry machinery and transport vehicles to minimize exhaust emissions and comply with regulated emission standards.

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Pre-Construction and Construction Phase

IMPACT

- High noise levels from chainsaws, bulldozers, and skidders during logging and land clearing, typically ranging between 70–90 dB(A) at source.
- Noise from heavy equipment operations (e.g., backhoes, graders, compactors) during construction of access roads, site office, and other quarry facilities.
- Intermittent engine and mechanical noise may cause disturbance to nearby residents and wildlife, especially during early morning or prolonged operations.

MITIGATION MEASURES

- Restrict high-noise activities (e.g., logging, earthworks) to daylight hours only (e.g., 8 a.m. – 6 p.m.) to minimize disturbance to nearby communities and wildlife.
- Maintain and service all machinery regularly to reduce mechanical noise from worn-out engines, loose components, and exhaust systems.
- Establish temporary noise barriers or buffer zones using natural vegetation strips or mobile sound barriers near sensitive receptors, such as residential areas or forest edges.



NOISE POLLUTION

Operational Phase

IMPACT

- Blasting and rock crushing generate high continuous noise levels, often exceeding 85–100 dB(A), which can lead to occupational noise hazards and environmental disturbance.
- Operation of crushers, conveyors, and generators contributes to elevated background noise, impacting surrounding communities and sensitive ecological zones.
- Frequent movement of heavy vehicles and loading equipment causes intermittent high-impact noise, especially during loading/unloading activities and peak operation hours.

✓ Modelling

- Conducted using **CadnaA software** for a worst-case, assuming all major equipment and trucks operate simultaneously.
- Noise levels at nearby sensitive receptors such as schools, villages and residential areas (N1–N6) range between 45 dBA and 52 dBA.

📊 Cumulative Noise Levels (Including Baseline)

- Comparison to **Daytime Permissible Limits: N1 and N4** slightly **exceed 55 dBA limit**.
- All other receptors remain **within acceptable limits**.
- Estimated noise increment at all receptors is <3 dBA; not perceptible to human hearing.
- Noise impact from quarry operations is minimal and generally compliant with limits.

MITIGATION MEASURES

- Install noise barriers or enclosures around high-noise equipment (e.g., crushers, generators) and along site boundaries near sensitive receptors.
- Apply advanced blasting techniques and limit high-noise activities (blasting, loading) to daytime hours (e.g., 8 a.m. – 6 p.m.).
- Implement a scheduled noise control plan.
- Use low-noise machinery and conduct regular maintenance to ensure optimal engine and exhaust system performance, reducing operational noise.

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Dust from drilling/crushing/screening; waste oil; lubricants.
- **Impact:** Hazardous if mismanaged — risks to environment, health, and water bodies (e.g., spills).

MITIGATION MEASURES

- Handle, store, transport, and dispose in accordance with EQA (Scheduled Wastes) Regulations 2005.
- Engage licensed contractors and use prescribed premises.



SCHEDULED WASTE

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Infrastructure setup and quarry decommissioning; includes concrete, metal, cables, timber, etc.
- **Impact:** - Accumulation causes obstruction, safety hazards, and site contamination.
- Possible subsoil contamination from buried materials (e.g., fuel tanks).

MITIGATION MEASURES

- Systematic removal and proper documentation during decommissioning.
- Avoid dumping in vegetated/buffer areas.



CONSTRUCTION & DEMOLITION WASTE

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Toilet and handwashing use by ~38 workers (~3.04 m³/day).
- **Impact:** Odour, vector attraction, and contamination of drains/surface water.

MITIGATION MEASURES

- Use mobile toilets, septic tanks, or holding tanks.
- Scheduled desludging and compliance with Sewage Regulations 2009 and PBT guidelines.



SEWAGE



FLORA & FAUNA

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Clearing for site preparation and access.
- **Impact:** - Loss of vegetative cover, displacement of small fauna.
- Moderate ecological significance due to already degraded habitat.

MITIGATION MEASURES

- Progressive clearing and erosion control.
- Monitor fauna; no rare/protected species identified.

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Heavy vehicle movement (internal haulage & external transport).
- **Impact:** - Dust, erosion, sedimentation, vehicle emissions, and road wear.
- Risk of accidents, especially near sensitive receptors.

MITIGATION MEASURES

- Use wheel washing, cover truck loads, and maintain haul roads.
- Implement traffic safety measures.



TRAFFIC & TRANSPORTATION



EMPLOYMENT & BUSINESS OPPORTUNITIES

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Workforce demand during site prep and operation (~38 workers).
- **Impact:** - Positive contribution to local economy and services.

MITIGATION MEASURES

- Prioritize local hiring and procurement
- Offer skill training to locals for quarry jobs

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Economic activity from quarry operations and support services.
- **Impact:** - Stimulates direct and indirect income, e.g., fuel, transport, catering.
- Supports future land use transition (housing development).

MITIGATION MEASURES

- Engage communities early and continuously
- Maintain open communication with authorities and residents



SOCIO-ECONOMIC



OCCUPATIONAL SAFETY & HEALTH

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** On-site operations, equipment, and poor worker housing.
- **Impact:** - Risks of injury, disease (respiratory issues), accidents, and psychological stress.

MITIGATION MEASURES

- Comply with Occupational Safety & Health (Amendment) Act 2022
- Conduct risk assessments and develop safety plans

Pre-Construction, Construction and Operational Phases

IMPACT

- **Source:** Soil and rock slope formation during excavation.
- **Impact:** - Minimal soil slope risk due to thin overburden.
- Potential for loose rocks after blasting on rock slopes.

MITIGATION MEASURES

- Apply engineering design for stable benches.
- Use controlled blasting, inspect and secure loose rock after blasting.



SLOPE STABILITY

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT

Operational Phase

IMPACT

- **Blasting Activities** involving use of explosives generate:
 - ❖ Ground vibration
 - ❖ Air blast (noise/overpressure)
 - ❖ Flyrock (ejected rock fragments)
- **Impacts (with Modelling Outcomes)**
 - ❖ **Ground Vibration**
 - Vibration effects depend more on **perceived nuisance** than structural damage
 - ❖ **Air Blast / Noise**
 - Sudden, short-duration noise due to shock waves from expanding gases
 - ❖ **Flyrock**
 - Risk arises from: Overcharging, Inadequate stemming or burden, Adverse geology or face irregularity, Poor blast sequencing
 - **Modelling result:**
 - With 0.26 kg/m³ charge, **maximum flyrock distance = 93 m**
 - **Nearest receptor:** - Taman Guar Perahu Indah (115 m west) – safe
 - SMK Guar Perahu Indah (140 m northwest) – safe
 - **Blast direction** planned **Southeast**, away from sensitive structures
 - Railway track (400 m west) is outside flyrock risk zone
 - ❖ **Explosives Handling Risks**
 - Improper handling/storage can lead to: Fatal explosions; Damage to structures; Overcharging effects (high vibration, flyrock); Risk of detonation during rain/lightning.



BLASTING

MITIGATION MEASURES

- **General Blasting Controls**
 - ❖ Use of registered, experienced shotfirer
 - ❖ No on-site magazine; explosives delivered only on blasting day
 - ❖ Any extra explosives to be fully used on same day
 - ❖ Regular inspection of face and drill alignment before charging
 - ❖ Blast direction intentionally designed away from receptors
- **Flyrock Mitigation**
 - ❖ Maintain proper stemming, spacing, and charge limits
 - ❖ Avoid overcharging and monitor ANFO column rise
 - ❖ Ensure accurate drilling on new benches
 - ❖ Always blast ≥ 100 m away from nearest receptor
- **Ground Vibration and Noise**
 - ❖ Follow blast design that maintains: PPV < 5 mm/s ; Air blast < 124 Dbl
 - ❖ Ensure confined charges and proper initiation sequence
- **Explosives Safety**
 - ❖ Proper handling, storing and transporting explosives
 - ❖ Follow the National laws and JMG regulations
 - ❖ Avoid blasting during lightning/storms
 - ❖ Prohibit worker misconduct near explosives
 - ❖ Keep explosives securely guarded, tracked, and logged

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT MONITORING, COMPLIANCE MONITORING AND PERFORMANCE MONITORING

| Impact/ Monitoring Aspect | Monitoring Parameter | Compliance Limit | Monitoring Frequency | | Impact Monitoring (IM) | Compliance Monitoring (CM) | Performance Monitoring (PM) |
|---------------------------------|---|---------------------|-----------------------|----------------------|------------------------------|----------------------------------|-----------------------------------|
| | | | Construction Stage | Operational Stage | | | |
| Surface Water Quality | ▪ pH | 6.0-9.0 | Monthly | Quarterly | √ | √ | Not Applicable |
| | ▪ Temperature | - | | | | | |
| | ▪ Turbidity | 5 NTU | | | | | |
| | ▪ Dissolved Oxygen (DO) | 5mg/L – 7mg/L | | | | | |
| | ▪ Chemical Oxygen Demand (COD) | 25mg/L | | | | | |
| | ▪ Biological Oxygen Demand (BOD ₅) | 3mg/L | | | | | |
| | ▪ Total Suspended Solid (TSS) | 50mg/L | | | | | |
| | ▪ Salinity | - | | | | | |
| | ▪ Nitrate (N) | - | | | | | |
| | ▪ Phosphorus (P) | 0.2 mg/L | | | | | |
| | ▪ Ammoniacal Nitrogen (NH ₃ -N) | 0.3 mg/L | | | | | |
| | ▪ Lead (Pb) | 0.05 | | | | | |
| | ▪ Zinc (Zn) | mg//L | | | | | |
| | ▪ Oil & Grease | 5 mg//L | | | | | |
| | ▪ Total coliform (CFU/100ml) | 7;N 5000 | | | | | |
| | ▪ Faecal Coliform (CFU/100ml) | 400 | | | | | |

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EXECUTIVE SUMMARY

SUMMARY OF IMPACT MONITORING, COMPLIANCE MONITORING AND PERFORMANCE MONITORING

| Impact/ Monitoring Aspect | Monitoring Parameter | Compliance Limit | Monitoring Frequency | Impact Monitoring (IM) | Compliance Monitoring (CM) | Performance Monitoring (PM) |
|---------------------------------|--|---|-------------------------|------------------------------|----------------------------------|-----------------------------------|
| ALL PHASES | | | | | | |
| Ambient Air Quality | <ul style="list-style-type: none"> · PM₁₀ · PM_{2.5} · NO₂ · SO₂ · CO · Ozone | 100µg/m ³ 35µg/m ³ 280µg/m ³ 80µg/m ³ 10mg/m ³ 180µg/m ³ | | | | |
| Noise Level | <ul style="list-style-type: none"> · L₁₀ · L₉₀ · L_{min} · L_{max} · L_{eq} | Guidelines for Environmental Noise Limits and Control, 3rd Edition (reprint 2021) – First Schedule * For Leq, Day- 60dBA & Night-55dBA | Quarterly | √ | √ | Not Applicable |
| Vibration Level | <ul style="list-style-type: none"> · Peak Particle Velocity at X-axis · Peak Particle Velocity at Y-axis · Peak Particle Velocity at Z-axis · Peak Vector Sum · Vertical Vibration Peak Velocity · Frequency | The Planning Guidelines for Environmental Vibration Limits & Control, Department of Environment | | | | |

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SUMMARY OF EIA STUDY FINDINGS

| Environment component | Summary of EIA study |
|-----------------------|--|
| Physical | <p>The project site features flat to gently undulating terrain (0–25 m elevation) with erosion-prone granite-derived soils. About 60% of the area has low slopes (0°–6°), while 12% has steeper gradients. It lies within the Sungai Perai Catchment, draining into Sungai Kulim and Sungai Kubang Semang, and is downstream of key water intakes—necessitating strict erosion and sediment control. Ambient air and noise levels comply with national standards, though quarry operations may raise dust and noise temporarily. These impacts are manageable with standard mitigation. Water quality ranges from Class II to III, with elevated TSS; sediment loads are expected to rise during rain but are controllable. Vibration predictions show compliance with DOE and JMG limits if controlled blasting methods are used.</p> |
| Biological | <p>Ecological assessments concluded that the site is characterized by disturbed vegetation, secondary growth and degraded habitats. No endangered or protected species were recorded. The faunal population is limited to common species that are tolerant of human disturbance. Given this, the ecological value of the site is low, and anticipated impacts from quarry operations are minimal. Rehabilitation after project completion, including replanting with native species, will further mitigate ecological loss..</p> |
| Social | <p>Social baseline studies revealed that the project area is surrounded by a semi-rural community involved in residential and small-scale agricultural activities. Community feedback, gathered through engagement and perception surveys, reflected both support and concern. Residents generally welcome the potential for job creation and local development but have raised issues related to traffic, dust, and blasting safety. With proper implementation of Corporate Social Responsibility (CSR) initiatives, regular stakeholder communication, and environmental controls, social impacts can be effectively managed.</p> |

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GENERAL RECOMMENDATIONS

The Project Proponent shall be responsible for all aspects related to the development of the project including the environmental planning of the project and its associated cost. The major roles and responsibilities of the proponent shall be the following:

- Allocating sufficient funds for implementation of Environmental Management Plan (EMP) including temporary pollution prevention and mitigation measures (P2M2).
- Ensuring the EMP including temporary and permanent pollution prevention and mitigation measures (P2M2) are implemented and maintained.
- Appointing and empowering Environmental Officers to oversee the day-to-day compliance.

Given the significant level of community opposition identified through the social survey—particularly concerning flooding, blasting safety, water contamination, noise, and increased traffic—it is imperative for the project proponent to adopt a transparent, inclusive, and continuous community engagement strategy.

In conclusion, success of the development in integrating with the surrounding developing areas will contribute towards the social acceptability of the proposed Project. Through strict commitment and supervision on-site, it is anticipated that the development can carry on within the context of a sustainable low carbon city framework development.